IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Atty. Docket No: 3914-3

In re patent application of

IUCHI, SATOSHI *et al.*

Serial No. 09/758,269

Filed: January 12, 2001

For: TRANSGENIC PLANTS CARRYING NEOXANTHIN CLEAVAGE ENZYME GENE

STATEMENT TO SUPPORT FILING AND SUBMISSION IN ACCORDANCE WITH 37 C.F.R. §§ 1.821-1.825

Assistant Commissioner for Patents
Washington, D.C. 20231
Box SEQUENCE

Sir:

In connection with a Sequence Listing submitted concurrently herewith, the undersigned hereby states that:

1.   the submission, filed herewith in accordance with 37 C.F.R. § 1.821(g), does not include new matter;

2.   the content of the attached paper copy and the attached computer readable copy of the Sequence Listing, submitted in accordance with 37 C.F.R. § 1.821(c) and (e), respectively, are the same; and
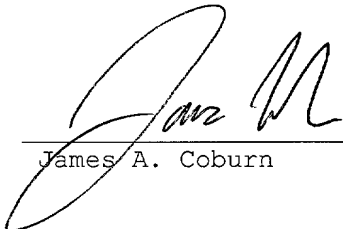
3.   all statements made herein of their own knowledge are true and that all statements made on information and belief are believed to be true; and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United

States Code and that such willful false statements may jeopardize the validity of the application or any patent resulting therefrom.

Respectfully submitted,

June 25, 2001
Date

James A. Coburn

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Portsmouth, N.H.
800-318-3021

1

SEQUENCE LISTING

<110> IUCHI, SATOSHI
       KOBAYASHI, MASATOMO
       SHINOZAKI, KAZUO

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Val Pro Glu Ser Ser Val Arg Arg Asn Leu Thr Val Glu Gly Thr Ile
        115             120                 125

cct gac tgc att gac ggt gtt tat atc cgt aac ggc gcg aat ccg atg    432
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        130             135                 140

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ggt tat ata ttt tgt cac gtt cat gac gaa gaa aca aag aca tca gag    1632
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Lys Arg Gln Leu Phe Thr Pro Arg Thr Thr Ala Thr Pro Pro Gln His
        50                  55                  60

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Pro Lys Thr Ala Asp Pro Arg Val Gln Ile Ala Gly Asn Tyr Ser Pro
                100                 105                 110

Val Pro Glu Ser Ser Val Arg Arg Asn Leu Thr Val Glu Gly Thr Ile
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Pro Asp Cys Ile Asp Gly Val Tyr Ile Arg Asn Gly Ala Asn Pro Met
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Phe Glu Pro Thr Ala Gly His His Leu Phe Asp Gly Asp Gly Met Val
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His Ala Val Lys Ile Thr Asn Gly Ser Ala Ser Tyr Ala Cys Arg Phe
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Ile Ser Gly Lys Ser Pro Val Val Phe Asp Gly Glu Lys Val Ser Arg
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Leu Gly Ile Met Pro Lys Asp Ala Thr Glu Ala Ser Gln Ile Ile Trp
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Val Asn Ser Pro Glu Thr Phe Cys Phe His Leu Trp Asn Ala Trp Glu
385   390   395   400

Ser Pro Glu Thr Glu Glu Ile Val Val Ile Gly Ser Cys Met Ser Pro
            405   410   415

Ala Asp Ser Ile Phe Asn Glu Arg Asp Glu Ser Leu Arg Ser Val Leu
            420   425   430

Ser Glu Ile Arg Ile Asn Leu Arg Thr Arg Lys Thr Thr Arg Arg Ser
        435   440   445

Leu Leu Val Asn Glu Asp Val Asn Leu Glu Ile Gly Met Val Asn Arg
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Asn Arg Leu Gly Arg Lys Thr Arg Phe Ala Phe Leu Ala Ile Ala Tyr
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Pro Trp Pro Lys Val Ser Gly Phe Ala Lys Val Asp Leu Cys Thr Gly
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cat cac tct ctt ctt cgc cgc cga tct tcc tct cct act ctc ctc cgt      96
His His Ser Leu Leu Arg Arg Arg Ser Ser Ser Pro Thr Leu Leu Arg
            20                  25                  30

atc aac tcc gcc gtc gtc gaa gaa cgt tct cca atc aca aac cca agc     144
Ile Asn Ser Ala Val Val Glu Glu Arg Ser Pro Ile Thr Asn Pro Ser
            35                  40                  45

gac aac aat gat cgt cgt aac aaa ccc aaa aca ctc cac aac cga acc     192
Asp Asn Asn Asp Arg Arg Asn Lys Pro Lys Thr Leu His Asn Arg Thr
    50                  55                  60

aat cac acc tta gtc tca tca cca ccg aaa ctc cga cca gaa atg act     240
Asn His Thr Leu Val Ser Ser Pro Pro Lys Leu Arg Pro Glu Met Thr
 65                  70                  75                  80

ctc gca aca gct ctc ttc acc acc gtc gaa gat gta atc aac acg ttc     288
Leu Ala Thr Ala Leu Phe Thr Thr Val Glu Asp Val Ile Asn Thr Phe
                85                  90                  95

atc gat cca cct tca cgt cct tcc gtt gat cca aaa cat gtc ctc tct     336
Ile Asp Pro Pro Ser Arg Pro Ser Val Asp Pro Lys His Val Leu Ser
            100                 105                 110

gat aac ttc gct cct gtc ctc gac gag ctt cct cca aca gac tgt gaa     384
Asp Asn Phe Ala Pro Val Leu Asp Glu Leu Pro Pro Thr Asp Cys Glu
            115                 120                 125
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aac ggt cca aat cca cag ttt ctc cct cgt ggt cct tac cat ctc ttc      480
Asn Gly Pro Asn Pro Gln Phe Leu Pro Arg Gly Pro Tyr His Leu Phe
145                 150                 155                 160

gac ggc gac ggt atg ctt cac gcc ata aaa atc cac aac ggt aaa gcc      528
Asp Gly Asp Gly Met Leu His Ala Ile Lys Ile His Asn Gly Lys Ala
                165                 170                 175

act ctc tgt agc aga tac gtc aag act tat aaa tac aac gtc gag aaa      576
Thr Leu Cys Ser Arg Tyr Val Lys Thr Tyr Lys Tyr Asn Val Glu Lys
                180                 185                 190

caa acc gga gct ccg gtt atg cct aac gtg ttt tcc gga ttc aac ggt      624
Gln Thr Gly Ala Pro Val Met Pro Asn Val Phe Ser Gly Phe Asn Gly
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Val Thr Ala Ser Val Ala Arg Gly Ala Leu Thr Ala Ala Arg Val Leu
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225                 230                 235                 240

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Leu Ala Phe Phe Ser Asn Arg Leu Phe Ala Leu Gly Glu Ser Asp Leu
                245                 250                 255

ccc tac gcc gtc cga tta acc gaa tca gga gat att gaa acg atc gga      816
Pro Tyr Ala Val Arg Leu Thr Glu Ser Gly Asp Ile Glu Thr Ile Gly
                260                 265                 270

cgg tac gat ttc gac ggg aaa tta gcg atg agt atg aca gct cat cct      864
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                275                 280                 285

aaa acc gat cca ata acc gga gaa act ttc gct ttc cgg tac ggt ccg      912
Lys Thr Asp Pro Ile Thr Gly Glu Thr Phe Ala Phe Arg Tyr Gly Pro
    290                 295                 300

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Val Pro Pro Phe Leu Thr Tyr Phe Arg Phe Asp Ser Ala Gly Lys Lys
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Val Gly Thr Asp Asn Gly Lys Thr Pro Arg Leu Gly Val Ile Pro Lys
        370                 375                 380

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385                 390                 395                 400

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                405                 410                 415

gtc gtt ttg att gca ccg aat att atg tcg att gaa cat act tta gag    1296
Val Val Leu Ile Ala Pro Asn Ile Met Ser Ile Glu His Thr Leu Glu
                420                 425                 430

agg atg gat ctg gtt cat gct ttg gtg gag aag gtg aag atc gat ctc    1344
Arg Met Asp Leu Val His Ala Leu Val Glu Lys Val Lys Ile Asp Leu
            435                 440                 445

gtc acc ggg att gtg aga cgt cat ccg atc tca gcg agg aat ctc gat    1392
Val Thr Gly Ile Val Arg Arg His Pro Ile Ser Ala Arg Asn Leu Asp
        450                 455                 460

ttc gct gtg att aat ccg gcg ttt ctc ggg aga tgt agc agg tac gtt    1440
Phe Ala Val Ile Asn Pro Ala Phe Leu Gly Arg Cys Ser Arg Tyr Val
465                 470                 475                 480

tac gcg gcg att gga gat ccg atg ccg aag atc tcc ggt gtg gtg aag    1488
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                485                 490                 495

ctt gat gtg tct aaa gga gat cgg gat gat tgt acg gtg gcc cgt aga    1536
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            500                 505                 510

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gat cct ggt aat ccg gag gcg gag gag gat gat ggt tat gtg gtg acg    1632
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            565                 570                 575
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Asn His Thr Leu Val Ser Ser Pro Pro Lys Leu Arg Pro Glu Met Thr
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Leu Ala Thr Ala Leu Phe Thr Thr Val Glu Asp Val Ile Asn Thr Phe
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Ile Asp Pro Pro Ser Arg Pro Ser Val Asp Pro Lys His Val Leu Ser
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Asp Asn Phe Ala Pro Val Leu Asp Glu Leu Pro Pro Thr Asp Cys Glu
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            130                 135                 140

Asn Gly Pro Asn Pro Gln Phe Leu Pro Arg Gly Pro Tyr His Leu Phe
145                 150                 155                 160

Asp Gly Asp Gly Met Leu His Ala Ile Lys Ile His Asn Gly Lys Ala
                165                 170                 175

Thr Leu Cys Ser Arg Tyr Val Lys Thr Tyr Lys Tyr Asn Val Glu Lys
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Gln Thr Gly Ala Pro Val Met Pro Asn Val Phe Ser Gly Phe Asn Gly
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Val Thr Ala Ser Val Ala Arg Gly Ala Leu Thr Ala Ala Arg Val Leu
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Leu Ala Phe Phe Ser Asn Arg Leu Phe Ala Leu Gly Glu Ser Asp Leu
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Pro Tyr Ala Val Arg Leu Thr Glu Ser Gly Asp Ile Glu Thr Ile Gly
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Arg Tyr Asp Phe Asp Gly Lys Leu Ala Met Ser Met Thr Ala His Pro
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Lys Thr Asp Pro Ile Thr Gly Glu Thr Phe Ala Phe Arg Tyr Gly Pro
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Val Pro Pro Phe Leu Thr Tyr Phe Arg Phe Asp Ser Ala Gly Lys Lys
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Gln Arg Asp Val Pro Ile Phe Ser Met Thr Ser Pro Ser Phe Leu His
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Asp Phe Ala Ile Thr Lys Arg His Ala Ile Phe Ala Glu Ile Gln Leu
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Gly Met Arg Met Asn Met Leu Asp Leu Val Leu Glu Gly Gly Ser Pro
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Val Gly Thr Asp Asn Gly Lys Thr Pro Arg Leu Gly Val Ile Pro Lys
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Tyr Ala Gly Asp Glu Ser Glu Met Lys Trp Phe Glu Val Pro Gly Phe
385             390                 395                 400

Asn Ile Ile His Ala Ile Asn Ala Trp Asp Glu Asp Asp Gly Asn Ser
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Val Val Leu Ile Ala Pro Asn Ile Met Ser Ile Glu His Thr Leu Glu
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Arg Met Asp Leu Val His Ala Leu Val Glu Lys Val Lys Ile Asp Leu
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Val Thr Gly Ile Val Arg Arg His Pro Ile Ser Ala Arg Asn Leu Asp
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Phe Ala Val Ile Asn Pro Ala Phe Leu Gly Arg Cys Ser Arg Tyr Val
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Tyr Ala Ala Ile Gly Asp Pro Met Pro Lys Ile Ser Gly Val Val Lys
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  1               5                  10                  15

ggc aat cat act cag ccg cca tta tcg tct tct caa agc tcc gac ttg    96
Gly Asn His Thr Gln Pro Pro Leu Ser Ser Ser Gln Ser Ser Asp Leu
                20                  25                  30

agt tat tgt agc tcc tta cct atg gcc agt cgt gtc aca cgt aag ctc   144
Ser Tyr Cys Ser Ser Leu Pro Met Ala Ser Arg Val Thr Arg Lys Leu
            35                  40                  45

aat gtt tca tct gcg ctt cac act cct cca gct ctt cat ttc cct aag   192
Asn Val Ser Ser Ala Leu His Thr Pro Pro Ala Leu His Phe Pro Lys
    50                  55                  60

caa tca tca aac tct ccc gcc att gtt gtt aag ccc aaa gcc aaa gaa   240
Gln Ser Ser Asn Ser Pro Ala Ile Val Val Lys Pro Lys Ala Lys Glu
65                  70                  75                  80

tcc aac act aaa cag atg aat ttg ttc cag aga gcg gcg gcg gca gcg   288
Ser Asn Thr Lys Gln Met Asn Leu Phe Gln Arg Ala Ala Ala Ala Ala
                85                  90                  95

ttg gac gcg gcg gag ggt ttc ctt gtc agc cac gag aag cta cac ccg   336
Leu Asp Ala Ala Glu Gly Phe Leu Val Ser His Glu Lys Leu His Pro
            100                 105                 110

ctt cct aaa acg gct gat cct agt gtt cag atc gcc gga aat ttt gct   384
Leu Pro Lys Thr Ala Asp Pro Ser Val Gln Ile Ala Gly Asn Phe Ala
            115                 120                 125
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ccg gtg aat gaa cag ccc gtc cgg cgt aat ctt ccg gtg gtc gga aaa      432
Pro Val Asn Glu Gln Pro Val Arg Arg Asn Leu Pro Val Val Gly Lys
    130                 135                 140

ctt ccc gat tcc atc aaa gga gtg tat gtg cgc aac gga gct aac cca      480
Leu Pro Asp Ser Ile Lys Gly Val Tyr Val Arg Asn Gly Ala Asn Pro
145                 150                 155                 160

ctt cac gag ccg gtg aca ggt cac cac ttc ttc gac gga gac ggt atg      528
Leu His Glu Pro Val Thr Gly His His Phe Phe Asp Gly Asp Gly Met
                165                 170                 175

gtt cac gcc gtc aaa ttc gaa cac ggt tca gct agc tac gct tgc cgg      576
Val His Ala Val Lys Phe Glu His Gly Ser Ala Ser Tyr Ala Cys Arg
                180                 185                 190

ttt act cag act aac cgg ttt gtt cag gaa cgt caa ttg ggt cga ccg      624
Phe Thr Gln Thr Asn Arg Phe Val Gln Glu Arg Gln Leu Gly Arg Pro
                195                 200                 205

gtt ttc ccc aaa gcc atc ggt gag ctt cac ggc cac acc ggt att gcc      672
Val Phe Pro Lys Ala Ile Gly Glu Leu His Gly His Thr Gly Ile Ala
    210                 215                 220

cga ctc atg cta ttc tac gcc aga gct gca gcc ggt ata gtc gac ccg      720
Arg Leu Met Leu Phe Tyr Ala Arg Ala Ala Ala Gly Ile Val Asp Pro
225                 230                 235                 240

gca cac gga acc ggt gta gct aac gcc ggt ttg gtc tat ttc aat ggc      768
Ala His Gly Thr Gly Val Ala Asn Ala Gly Leu Val Tyr Phe Asn Gly
                245                 250                 255

cgg tta ttg gct atg tcg gag gat gat tta cct tac caa gtt cag atc      816
Arg Leu Leu Ala Met Ser Glu Asp Asp Leu Pro Tyr Gln Val Gln Ile
                260                 265                 270

act ccc aat gga gat tta aaa acc gtt ggt cgg ttc gat ttt gat gga      864
Thr Pro Asn Gly Asp Leu Lys Thr Val Gly Arg Phe Asp Phe Asp Gly
                275                 280                 285

caa tta gaa tcc aca atg att gcc cac ccg aaa gtc gac ccg gaa tcc      912
Gln Leu Glu Ser Thr Met Ile Ala His Pro Lys Val Asp Pro Glu Ser
    290                 295                 300

ggt gaa ctc ttc gct tta agc tac gac gtc gtt tca aag cct tac cta      960
Gly Glu Leu Phe Ala Leu Ser Tyr Asp Val Val Ser Lys Pro Tyr Leu
305                 310                 315                 320

aaa tac ttc cga ttc tca ccg gac gga act aaa tca ccg gac gtc gag     1008
Lys Tyr Phe Arg Phe Ser Pro Asp Gly Thr Lys Ser Pro Asp Val Glu
                325                 330                 335

att cag ctt gat cag cca acg atg atg cac gat ttc gcg att aca gag     1056
Ile Gln Leu Asp Gln Pro Thr Met Met His Asp Phe Ala Ile Thr Glu
                340                 345                 350
```

```
aac ttc gtc gtc gta cct gac cag caa gtc gtt ttc aag ctg ccg gag    1104
Asn Phe Val Val Val Pro Asp Gln Gln Val Val Phe Lys Leu Pro Glu
        355             360             365

atg atc cgc ggt ggg tct ccg gtg gtt tac gac aag aac aag gtc gca    1152
Met Ile Arg Gly Gly Ser Pro Val Val Tyr Asp Lys Asn Lys Val Ala
        370             375             380

aga ttc ggg att tta gac aaa tac gcc gaa gat tca tcg aac att aag    1200
Arg Phe Gly Ile Leu Asp Lys Tyr Ala Glu Asp Ser Ser Asn Ile Lys
385             390             395             400

tgg att gat gct cca gat tgc ttc tgc ttc cat ctc tgg aac gct tgg    1248
Trp Ile Asp Ala Pro Asp Cys Phe Cys Phe His Leu Trp Asn Ala Trp
                405             410             415

gaa gag cca gaa aca gat gaa gtc gtc gtg ata ggg tcc tgt atg act    1296
Glu Glu Pro Glu Thr Asp Glu Val Val Val Ile Gly Ser Cys Met Thr
            420             425             430

cca cca gac tca att ttc aac gag tct gac gag aat ctc aag agt gtc    1344
Pro Pro Asp Ser Ile Phe Asn Glu Ser Asp Glu Asn Leu Lys Ser Val
            435             440             445

ctg tct gaa atc cgc ctg aat ctc aaa acc ggt gaa tca act cgc cgt    1392
Leu Ser Glu Ile Arg Leu Asn Leu Lys Thr Gly Glu Ser Thr Arg Arg
        450             455             460

ccg atc atc tcc aac gaa gat caa caa gtc aac ctc gaa gca ggg atg    1440
Pro Ile Ile Ser Asn Glu Asp Gln Gln Val Asn Leu Glu Ala Gly Met
465             470             475             480

gtc aac aga aac atg ctc ggc cgt aaa acc aaa ttc gct tac ttg gct    1488
Val Asn Arg Asn Met Leu Gly Arg Lys Thr Lys Phe Ala Tyr Leu Ala
                485             490             495

tta gcc gag ccg tgg cct aaa gtc tca gga ttc gct aaa gtt gat ctc    1536
Leu Ala Glu Pro Trp Pro Lys Val Ser Gly Phe Ala Lys Val Asp Leu
            500             505             510

act act gga gaa gtt aag aaa cat ctt tac ggc gat aac cgt tac gga    1584
Thr Thr Gly Glu Val Lys Lys His Leu Tyr Gly Asp Asn Arg Tyr Gly
            515             520             525

gga gag cct ctg ttt ctc ccc gga gaa gga gga gag gaa gac gaa gga    1632
Gly Glu Pro Leu Phe Leu Pro Gly Glu Gly Gly Glu Glu Asp Glu Gly
            530             535             540

tac atc ctc tgt ttc gtt cac gac gag aag aca tgg aaa tcg gag tta    1680
Tyr Ile Leu Cys Phe Val His Asp Glu Lys Thr Trp Lys Ser Glu Leu
545             550             555             560

cag ata gtt aac gcc gtt agc tta gag gtt gaa gca acg gtt aaa ctt    1728
Gln Ile Val Asn Ala Val Ser Leu Glu Val Glu Ala Thr Val Lys Leu
            565             570             575
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ccg tca agg gtt ccg tac gga ttt cac ggt aca ttc atc gga gcc gat    1776
Pro Ser Arg Val Pro Tyr Gly Phe His Gly Thr Phe Ile Gly Ala Asp
            580                 585                 590

gat ttg gcg aag cag gtc gtg tga                                    1800
Asp Leu Ala Lys Gln Val Val
            595
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<212> PRT
<213> Arabidopsis thaliana

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Met Ala Ser Phe Thr Ala Thr Ala Ala Val Ser Gly Arg Trp Leu Gly
 1               5                  10                  15

Gly Asn His Thr Gln Pro Pro Leu Ser Ser Ser Gln Ser Ser Asp Leu
            20                  25                  30

Ser Tyr Cys Ser Ser Leu Pro Met Ala Ser Arg Val Thr Arg Lys Leu
            35                  40                  45

Asn Val Ser Ser Ala Leu His Thr Pro Pro Ala Leu His Phe Pro Lys
        50                  55                  60

Gln Ser Ser Asn Ser Pro Ala Ile Val Val Lys Pro Lys Ala Lys Glu
 65                  70                  75                  80

Ser Asn Thr Lys Gln Met Asn Leu Phe Gln Arg Ala Ala Ala Ala Ala
                85                  90                  95

Leu Asp Ala Ala Glu Gly Phe Leu Val Ser His Glu Lys Leu His Pro
            100                 105                 110

Leu Pro Lys Thr Ala Asp Pro Ser Val Gln Ile Ala Gly Asn Phe Ala
            115                 120                 125

Pro Val Asn Glu Gln Pro Val Arg Arg Asn Leu Pro Val Val Gly Lys
            130                 135                 140

Leu Pro Asp Ser Ile Lys Gly Val Tyr Val Arg Asn Gly Ala Asn Pro
145                 150                 155                 160

Leu His Glu Pro Val Thr Gly His His Phe Phe Asp Gly Asp Gly Met
                165                 170                 175

Val His Ala Val Lys Phe Glu His Gly Ser Ala Ser Tyr Ala Cys Arg
            180                 185                 190

Phe Thr Gln Thr Asn Arg Phe Val Gln Glu Arg Gln Leu Gly Arg Pro
            195                 200                 205

Val Phe Pro Lys Ala Ile Gly Glu Leu His Gly His Thr Gly Ile Ala
            210                 215                 220
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```
Arg Leu Met Leu Phe Tyr Ala Arg Ala Ala Ala Gly Ile Val Asp Pro
225             230             235                         240

Ala His Gly Thr Gly Val Ala Asn Ala Gly Leu Val Tyr Phe Asn Gly
            245             250                 255

Arg Leu Leu Ala Met Ser Glu Asp Asp Leu Pro Tyr Gln Val Gln Ile
            260             265                 270

Thr Pro Asn Gly Asp Leu Lys Thr Val Gly Arg Phe Asp Phe Asp Gly
            275             280                 285

Gln Leu Glu Ser Thr Met Ile Ala His Pro Lys Val Asp Pro Glu Ser
            290             295                 300

Gly Glu Leu Phe Ala Leu Ser Tyr Asp Val Val Ser Lys Pro Tyr Leu
305             310             315                         320

Lys Tyr Phe Arg Phe Ser Pro Asp Gly Thr Lys Ser Pro Asp Val Glu
                325             330                 335

Ile Gln Leu Asp Gln Pro Thr Met Met His Asp Phe Ala Ile Thr Glu
            340             345                 350

Asn Phe Val Val Val Pro Asp Gln Gln Val Val Phe Lys Leu Pro Glu
            355             360                 365

Met Ile Arg Gly Gly Ser Pro Val Val Tyr Asp Lys Asn Lys Val Ala
    370             375             380

Arg Phe Gly Ile Leu Asp Lys Tyr Ala Glu Asp Ser Ser Asn Ile Lys
385             390             395                         400

Trp Ile Asp Ala Pro Asp Cys Phe Cys Phe His Leu Trp Asn Ala Trp
            405             410                 415

Glu Glu Pro Glu Thr Asp Glu Val Val Val Ile Gly Ser Cys Met Thr
            420             425                 430

Pro Pro Asp Ser Ile Phe Asn Glu Ser Asp Glu Asn Leu Lys Ser Val
            435             440                 445

Leu Ser Glu Ile Arg Leu Asn Leu Lys Thr Gly Glu Ser Thr Arg Arg
    450             455             460

Pro Ile Ile Ser Asn Glu Asp Gln Gln Val Asn Leu Glu Ala Gly Met
465             470             475                         480

Val Asn Arg Asn Met Leu Gly Arg Lys Thr Lys Phe Ala Tyr Leu Ala
            485             490                 495

Leu Ala Glu Pro Trp Pro Lys Val Ser Gly Phe Ala Lys Val Asp Leu
            500             505                 510

Thr Thr Gly Glu Val Lys Lys His Leu Tyr Gly Asp Asn Arg Tyr Gly
    515             520                 525
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```
Gly Glu Pro Leu Phe Leu Pro Gly Glu Gly Gly Glu Glu Asp Glu Gly
    530                 535                 540

Tyr Ile Leu Cys Phe Val His Asp Glu Lys Thr Trp Lys Ser Glu Leu
545                 550                 555                 560

Gln Ile Val Asn Ala Val Ser Leu Glu Val Glu Ala Thr Val Lys Leu
                565                 570                 575

Pro Ser Arg Val Pro Tyr Gly Phe His Gly Thr Phe Ile Gly Ala Asp
                580                 585                 590

Asp Leu Ala Lys Gln Val Val
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<211> 1617
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<213> Arabidopsis thaliana

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<222> (1)..(1614)

<400> 7

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atg gcg gag aaa ctc agt gat ggc agc agc atc atc tca gtc cat cct      48
Met Ala Glu Lys Leu Ser Asp Gly Ser Ser Ile Ile Ser Val His Pro
 1               5                  10                  15

aga ccc tcc aag ggt ttc tcc tcg aag ctt ctc gat ctt ctc gag aga      96
Arg Pro Ser Lys Gly Phe Ser Ser Lys Leu Leu Asp Leu Leu Glu Arg
                20                  25                  30

ctt gtt gtc aag ctc atg cac gat gct tct ctc cct ctc cac tac ctc     144
Leu Val Val Lys Leu Met His Asp Ala Ser Leu Pro Leu His Tyr Leu
            35                  40                  45

tca ggc aac ttc gct ccc atc cgt gat gaa act cct ccc gtc aag gat     192
Ser Gly Asn Phe Ala Pro Ile Arg Asp Glu Thr Pro Pro Val Lys Asp
        50                  55                  60

ctc ccc gtc cat gga ttt ctt ccc gaa tgc ttg aat ggt gaa ttt gtg     240
Leu Pro Val His Gly Phe Leu Pro Glu Cys Leu Asn Gly Glu Phe Val
65                  70                  75                  80

agg gtt ggt cca aac ccc aag ttt gat gct gtc gct gga tat cac tgg     288
Arg Val Gly Pro Asn Pro Lys Phe Asp Ala Val Ala Gly Tyr His Trp
                85                  90                  95

ttt gat gga gat ggg atg att cat ggg gta cgc atc aaa gat ggg aaa     336
Phe Asp Gly Asp Gly Met Ile His Gly Val Arg Ile Lys Asp Gly Lys
                100                 105                 110

gct act tat gtt tct cga tat gtt aag aca tca cgt ctt aag cag gaa     384
Ala Thr Tyr Val Ser Arg Tyr Val Lys Thr Ser Arg Leu Lys Gln Glu
            115                 120                 125
```

```
gag ttc ttc gga gct gcc aaa ttc atg aag att ggt gac ctt aag ggg    432
Glu Phe Phe Gly Ala Ala Lys Phe Met Lys Ile Gly Asp Leu Lys Gly
    130             135             140

ttt ttc gga ttg cta atg gtc aat gtc caa cag ctg aga acg aag ctc    480
Phe Phe Gly Leu Leu Met Val Asn Val Gln Gln Leu Arg Thr Lys Leu
145             150             155                 160

aaa ata ttg gac aac act tat gga aat gga act gcc aat aca gca ctc    528
Lys Ile Leu Asp Asn Thr Tyr Gly Asn Gly Thr Ala Asn Thr Ala Leu
                165             170             175

gta tat cac cat gga aaa ctt cta gca tta cag gag gca gat aag ccg    576
Val Tyr His His Gly Lys Leu Leu Ala Leu Gln Glu Ala Asp Lys Pro
            180             185             190

tac gtc atc aaa gtt ttg gaa gat gga gac ctg caa act ctt ggt ata    624
Tyr Val Ile Lys Val Leu Glu Asp Gly Asp Leu Gln Thr Leu Gly Ile
            195             200             205

ata gat tat gac aag aga ttg acc cac tcc ttc act gct cac cca aaa    672
Ile Asp Tyr Asp Lys Arg Leu Thr His Ser Phe Thr Ala His Pro Lys
    210             215             220

gtt gac ccg gtt acg ggt gaa atg ttt aca ttc ggc tat tcg cat acg    720
Val Asp Pro Val Thr Gly Glu Met Phe Thr Phe Gly Tyr Ser His Thr
225             230             235             240

cca cct tat ctc aca tac aga gtt atc tcg aaa gat ggc att atg cat    768
Pro Pro Tyr Leu Thr Tyr Arg Val Ile Ser Lys Asp Gly Ile Met His
                245             250             255

gac cca gtc cca att act ata tca gag cct atc atg atg cat gat ttt    816
Asp Pro Val Pro Ile Thr Ile Ser Glu Pro Ile Met Met His Asp Phe
                260             265             270

gct att act gag act tat gca atc ttc atg gat ctt cct atg cac ttc    864
Ala Ile Thr Glu Thr Tyr Ala Ile Phe Met Asp Leu Pro Met His Phe
            275             280             285

agg cca aag gaa atg gtg aaa gag aag aaa atg ata tac tca ttt gat    912
Arg Pro Lys Glu Met Val Lys Glu Lys Lys Met Ile Tyr Ser Phe Asp
    290             295             300

ccc aca aaa aag gct cgt ttt ggt gtt ctt cca cgc tat gcc aag gat    960
Pro Thr Lys Lys Ala Arg Phe Gly Val Leu Pro Arg Tyr Ala Lys Asp
305             310             315             320

gaa ctt atg att aga tgg ttt gag ctt ccc aac tgc ttt att ttc cac    1008
Glu Leu Met Ile Arg Trp Phe Glu Leu Pro Asn Cys Phe Ile Phe His
                325             330             335

aac gcc aat gct tgg gaa gaa gag gat gaa gtc gtc ctc atc act tgt    1056
Asn Ala Asn Ala Trp Glu Glu Glu Asp Glu Val Val Leu Ile Thr Cys
            340             345             350
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cgt ctt gag aat cca gat ctt gac atg gtc agt ggg aaa gtg aaa gaa    1104
Arg Leu Glu Asn Pro Asp Leu Asp Met Val Ser Gly Lys Val Lys Glu
        355                 360                 365

aaa ctc gaa aat ttt ggc aac gaa ctg tac gaa atg aga ttc aac atg    1152
Lys Leu Glu Asn Phe Gly Asn Glu Leu Tyr Glu Met Arg Phe Asn Met
        370                 375                 380

aaa acg ggc tca gct tct caa aaa aaa cta tcc gca tct gcg gtt gat    1200
Lys Thr Gly Ser Ala Ser Gln Lys Lys Leu Ser Ala Ser Ala Val Asp
385                 390                 395                 400

ttc ccc aga atc aat gag tgc tac acc gga aag aaa cag aga tac gta    1248
Phe Pro Arg Ile Asn Glu Cys Tyr Thr Gly Lys Lys Gln Arg Tyr Val
                405                 410                 415

tat gga aca att ctg gac agt atc gca aag gtt acc gga atc atc aag    1296
Tyr Gly Thr Ile Leu Asp Ser Ile Ala Lys Val Thr Gly Ile Ile Lys
                420                 425                 430

ttt gat ctg cat gca gaa gct gag aca ggg aaa aga atg ctg gaa gta    1344
Phe Asp Leu His Ala Glu Ala Glu Thr Gly Lys Arg Met Leu Glu Val
            435                 440                 445

gga ggt aat atc aaa gga ata tat gac ctg gga gaa ggc aga tat ggt    1392
Gly Gly Asn Ile Lys Gly Ile Tyr Asp Leu Gly Glu Gly Arg Tyr Gly
        450                 455                 460

tca gag gct atc tat gtt ccg cgt gag aca gca gaa gaa gac gac ggt    1440
Ser Glu Ala Ile Tyr Val Pro Arg Glu Thr Ala Glu Glu Asp Asp Gly
465                 470                 475                 480

tac ttg ata ttc ttt gtt cat gat gaa aac aca ggg aaa tca tgc gtg    1488
Tyr Leu Ile Phe Phe Val His Asp Glu Asn Thr Gly Lys Ser Cys Val
                485                 490                 495

act gtg ata gac gca aaa aca atg tcg gct gaa ccg gtg gca gtg gtg    1536
Thr Val Ile Asp Ala Lys Thr Met Ser Ala Glu Pro Val Ala Val Val
                500                 505                 510

gag ctg ccg cac agg gtc cca tat ggc ttc cat gcc ttg ttt gtt aca    1584
Glu Leu Pro His Arg Val Pro Tyr Gly Phe His Ala Leu Phe Val Thr
            515                 520                 525

gag gaa caa ctc cag gaa caa act ctt ata taa                        1617
Glu Glu Gln Leu Gln Glu Gln Thr Leu Ile
        530                 535
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Met Ala Glu Lys Leu Ser Asp Gly Ser Ser Ile Ile Ser Val His Pro
 1               5                  10                  15
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Arg Pro Ser Lys Gly Phe Ser Ser Lys Leu Leu Asp Leu Leu Glu Arg
            20   25   30

Leu Val Val Lys Leu Met His Asp Ala Ser Leu Pro Leu His Tyr Leu
            35   40   45

Ser Gly Asn Phe Ala Pro Ile Arg Asp Glu Thr Pro Pro Val Lys Asp
        50   55   60

Leu Pro Val His Gly Phe Leu Pro Glu Cys Leu Asn Gly Glu Phe Val
65   70   75   80

Arg Val Gly Pro Asn Pro Lys Phe Asp Ala Val Ala Gly Tyr His Trp
                85   90   95

Phe Asp Gly Asp Gly Met Ile His Gly Val Arg Ile Lys Asp Gly Lys
            100   105   110

Ala Thr Tyr Val Ser Arg Tyr Val Lys Thr Ser Arg Leu Lys Gln Glu
            115   120   125

Glu Phe Phe Gly Ala Ala Lys Phe Met Lys Ile Gly Asp Leu Lys Gly
    130   135   140

Phe Phe Gly Leu Leu Met Val Asn Val Gln Gln Leu Arg Thr Lys Leu
145   150   155   160

Lys Ile Leu Asp Asn Thr Tyr Gly Asn Gly Thr Ala Asn Thr Ala Leu
                165   170   175

Val Tyr His His Gly Lys Leu Leu Ala Leu Gln Glu Ala Asp Lys Pro
                180   185   190

Tyr Val Ile Lys Val Leu Glu Asp Gly Asp Leu Gln Thr Leu Gly Ile
        195   200   205

Ile Asp Tyr Asp Lys Arg Leu Thr His Ser Phe Thr Ala His Pro Lys
    210   215   220

Val Asp Pro Val Thr Gly Glu Met Phe Thr Phe Gly Tyr Ser His Thr
225   230   235   240

Pro Pro Tyr Leu Thr Tyr Arg Val Ile Ser Lys Asp Gly Ile Met His
            245   250   255

Asp Pro Val Pro Ile Thr Ile Ser Glu Pro Ile Met Met His Asp Phe
            260   265   270

Ala Ile Thr Glu Thr Tyr Ala Ile Phe Met Asp Leu Pro Met His Phe
        275   280   285

Arg Pro Lys Glu Met Val Lys Glu Lys Lys Met Ile Tyr Ser Phe Asp
    290   295   300

Pro Thr Lys Lys Ala Arg Phe Gly Val Leu Pro Arg Tyr Ala Lys Asp
305   310   315   320

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Glu Leu Met Ile Arg Trp Phe Glu Leu Pro Asn Cys Phe Ile Phe His
                325             330             335

Asn Ala Asn Ala Trp Glu Glu Glu Asp Glu Val Val Leu Ile Thr Cys
            340             345             350

Arg Leu Glu Asn Pro Asp Leu Asp Met Val Ser Gly Lys Val Lys Glu
        355             360             365

Lys Leu Glu Asn Phe Gly Asn Glu Leu Tyr Glu Met Arg Phe Asn Met
    370             375             380

Lys Thr Gly Ser Ala Ser Gln Lys Lys Leu Ser Ala Ser Ala Val Asp
385             390             395             400

Phe Pro Arg Ile Asn Glu Cys Tyr Thr Gly Lys Lys Gln Arg Tyr Val
            405             410             415

Tyr Gly Thr Ile Leu Asp Ser Ile Ala Lys Val Thr Gly Ile Ile Lys
            420             425             430

Phe Asp Leu His Ala Glu Ala Glu Thr Gly Lys Arg Met Leu Glu Val
        435             440             445

Gly Gly Asn Ile Lys Gly Ile Tyr Asp Leu Gly Glu Gly Arg Tyr Gly
    450             455             460

Ser Glu Ala Ile Tyr Val Pro Arg Glu Thr Ala Glu Glu Asp Asp Gly
465             470             475             480

Tyr Leu Ile Phe Phe Val His Asp Glu Asn Thr Gly Lys Ser Cys Val
            485             490             495

Thr Val Ile Asp Ala Lys Thr Met Ser Ala Glu Pro Val Ala Val Val
            500             505             510

Glu Leu Pro His Arg Val Pro Tyr Gly Phe His Ala Leu Phe Val Thr
        515             520             525

Glu Glu Gln Leu Gln Glu Gln Thr Leu Ile
    530             535


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<213> Arabidopsis thaliana

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<222> (1)..(1731)

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Met Gln His Ser Leu Arg Ser Asp Leu Leu Pro Thr Lys Thr Ser Pro
  1               5                  10                  15
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```
cgt tct cat tta ctt cca caa ccc aaa aat gca aat att tct cga cga    96
Arg Ser His Leu Leu Pro Gln Pro Lys Asn Ala Asn Ile Ser Arg Arg
            20                  25                  30

att ctc att aac cct ttc aag ata ccg aca ctt cct gat ctc act tct   144
Ile Leu Ile Asn Pro Phe Lys Ile Pro Thr Leu Pro Asp Leu Thr Ser
            35                  40                  45

ccg gtt ccg tca ccg gtt aag ctc aaa cca acg tat cca aac tta aac   192
Pro Val Pro Ser Pro Val Lys Leu Lys Pro Thr Tyr Pro Asn Leu Asn
            50                  55                  60

ctt ctt cag aag cta gcg gct acg atg ctc gac aag att gag tcc tct   240
Leu Leu Gln Lys Leu Ala Ala Thr Met Leu Asp Lys Ile Glu Ser Ser
65                  70                  75                  80

atc gtt att cct atg gag cag aat cgc ccg ctt cct aaa ccg acc gac   288
Ile Val Ile Pro Met Glu Gln Asn Arg Pro Leu Pro Lys Pro Thr Asp
                    85                  90                  95

ccg gcg gtt caa tta tca ggt aac ttc gct ccg gtt aat gaa tgt ccg   336
Pro Ala Val Gln Leu Ser Gly Asn Phe Ala Pro Val Asn Glu Cys Pro
                100                 105                 110

gtt cag aac ggt tta gaa gtg gtt ggt cag att cct tct tgt cta aaa   384
Val Gln Asn Gly Leu Glu Val Val Gly Gln Ile Pro Ser Cys Leu Lys
                115                 120                 125

gga gtt tac atc cgt aac ggt gca aac cct atg ttt ccg ccg tta gcc   432
Gly Val Tyr Ile Arg Asn Gly Ala Asn Pro Met Phe Pro Pro Leu Ala
            130                 135                 140

gga cat cat tta ttt gac ggt gac gga atg att cac gcc gtt agt atc   480
Gly His His Leu Phe Asp Gly Asp Gly Met Ile His Ala Val Ser Ile
145                 150                 155                 160

ggt ttt gat aac cag gtt agt tac agc tgc cgg tac act aaa aca aac   528
Gly Phe Asp Asn Gln Val Ser Tyr Ser Cys Arg Tyr Thr Lys Thr Asn
                    165                 170                 175

cgg ctt gtt caa gaa acc gcg ctt gga cga tcg gtt ttc cct aaa cca   576
Arg Leu Val Gln Glu Thr Ala Leu Gly Arg Ser Val Phe Pro Lys Pro
                180                 185                 190

atc ggc gag ctt cac ggc cat tcc ggt cta gct cga ctc gct ctc ttc   624
Ile Gly Glu Leu His Gly His Ser Gly Leu Ala Arg Leu Ala Leu Phe
            195                 200                 205

acg gct cga gct ggg atc ggt cta gtg gac ggg aca cgt ggc atg ggc   672
Thr Ala Arg Ala Gly Ile Gly Leu Val Asp Gly Thr Arg Gly Met Gly
            210                 215                 220

gta gct aac gcc ggt gtg gtt ttc ttt aac ggc agg tta tta gcc atg   720
Val Ala Asn Ala Gly Val Val Phe Phe Asn Gly Arg Leu Leu Ala Met
225                 230                 235                 240
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tca gaa gat gat ctt cct tac caa gtg aag atc gac ggt caa gga gat    768
Ser Glu Asp Asp Leu Pro Tyr Gln Val Lys Ile Asp Gly Gln Gly Asp
                245                 250                 255

ctt gag acg atc gga cgg ttc gga ttc gat gac cag att gac tct tca    816
Leu Glu Thr Ile Gly Arg Phe Gly Phe Asp Asp Gln Ile Asp Ser Ser
                    260                 265                 270

gtg ata gcg cat cct aag gtg gac gcg acc aca gga gat ctc cat aca    864
Val Ile Ala His Pro Lys Val Asp Ala Thr Thr Gly Asp Leu His Thr
                275                 280                 285

ctg agc tac aac gtt ttg aag aaa cct cat ctc agg tat ctt aaa ttc    912
Leu Ser Tyr Asn Val Leu Lys Lys Pro His Leu Arg Tyr Leu Lys Phe
                290                 295                 300

aac acg tgc ggg aaa aag aca cgt gac gtg gag atc acg ctc cct gaa    960
Asn Thr Cys Gly Lys Lys Thr Arg Asp Val Glu Ile Thr Leu Pro Glu
305                 310                 315                 320

cca acg atg att cat gat ttc gcg ata acc gag aat ttt gtc gtt ata   1008
Pro Thr Met Ile His Asp Phe Ala Ile Thr Glu Asn Phe Val Val Ile
                    325                 330                 335

ccg gat cag caa atg gta ttc aaa tta tcc gaa atg att cgg ggc ggg   1056
Pro Asp Gln Gln Met Val Phe Lys Leu Ser Glu Met Ile Arg Gly Gly
                340                 345                 350

tca ccc gtt atc tac gtt aaa gaa aaa atg gcg aga ttt gga gtt ttg   1104
Ser Pro Val Ile Tyr Val Lys Glu Lys Met Ala Arg Phe Gly Val Leu
                355                 360                 365

tca aag cag gat ctg acc ggg tcg gat ata aat tgg gtt gat gta ccg   1152
Ser Lys Gln Asp Leu Thr Gly Ser Asp Ile Asn Trp Val Asp Val Pro
                370                 375                 380

gat tgt ttc tgt ttc cat cta tgg aat gcg tgg gaa gag aga acc gaa   1200
Asp Cys Phe Cys Phe His Leu Trp Asn Ala Trp Glu Glu Arg Thr Glu
385                 390                 395                 400

gag gga gac cca gtt atc gtc gta atc ggg tca tgt atg agc cca ccc   1248
Glu Gly Asp Pro Val Ile Val Val Ile Gly Ser Cys Met Ser Pro Pro
                    405                 410                 415

gac acg atc ttt agt gaa tca gga gaa cca acc cgg gtt gaa tta agt   1296
Asp Thr Ile Phe Ser Glu Ser Gly Glu Pro Thr Arg Val Glu Leu Ser
                420                 425                 430

gag atc cgg tta aac atg cgt aca aaa gaa tcg aac cgt aag gtt atc   1344
Glu Ile Arg Leu Asn Met Arg Thr Lys Glu Ser Asn Arg Lys Val Ile
                435                 440                 445

gta acc gga gtg aat tta gaa gcg ggt cac ata aac cgt agt tac gtg   1392
Val Thr Gly Val Asn Leu Glu Ala Gly His Ile Asn Arg Ser Tyr Val
450                 455                 460
```

```
ggc cgg aaa agc cag ttc gtt tac ata gca ata gcc gat cct tgg ccc   1440
Gly Arg Lys Ser Gln Phe Val Tyr Ile Ala Ile Ala Asp Pro Trp Pro
465             470             475                 480

aaa tgc agt ggc att gcg aag gta gat ata caa aac ggc acc gtt tca   1488
Lys Cys Ser Gly Ile Ala Lys Val Asp Ile Gln Asn Gly Thr Val Ser
                485             490                 495

gag ttt aat tac gga ccg agc cgg ttc ggt gga gaa ccg tgc ttt gta   1536
Glu Phe Asn Tyr Gly Pro Ser Arg Phe Gly Gly Glu Pro Cys Phe Val
                500             505             510

ccg gag gga gaa gga gaa gaa gac aaa ggt tat gta atg ggg ttt gtg   1584
Pro Glu Gly Glu Gly Glu Glu Asp Lys Gly Tyr Val Met Gly Phe Val
            515             520             525

aga gac gaa gag aaa gac gag tcg gag ttt gtg gtg gtc gac gcg acg   1632
Arg Asp Glu Glu Lys Asp Glu Ser Glu Phe Val Val Val Asp Ala Thr
    530             535             540

gat atg aag caa gtc gcg gcg gtg cgc ttg ccg gag agg gta cct tat   1680
Asp Met Lys Gln Val Ala Ala Val Arg Leu Pro Glu Arg Val Pro Tyr
545             550             555             560

ggt ttc cat gga acg ttc gtg agc gag aat cag ttg aag gaa caa gtt   1728
Gly Phe His Gly Thr Phe Val Ser Glu Asn Gln Leu Lys Glu Gln Val
                565             570             575

ttc tga                                                            1734
Phe
```

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<210> 10
<211> 577
<212> PRT
<213> Arabidopsis thaliana

<400> 10
Met Gln His Ser Leu Arg Ser Asp Leu Leu Pro Thr Lys Thr Ser Pro
1               5               10                  15

Arg Ser His Leu Leu Pro Gln Pro Lys Asn Ala Asn Ile Ser Arg Arg
                20              25                  30

Ile Leu Ile Asn Pro Phe Lys Ile Pro Thr Leu Pro Asp Leu Thr Ser
            35              40                  45

Pro Val Pro Ser Pro Val Lys Leu Lys Pro Thr Tyr Pro Asn Leu Asn
        50              55                  60

Leu Leu Gln Lys Leu Ala Ala Thr Met Leu Asp Lys Ile Glu Ser Ser
65              70              75                  80

Ile Val Ile Pro Met Glu Gln Asn Arg Pro Leu Pro Lys Pro Thr Asp
                85              90                  95

Pro Ala Val Gln Leu Ser Gly Asn Phe Ala Pro Val Asn Glu Cys Pro
            100             105                 110
```

```
Val Gln Asn Gly Leu Glu Val Val Gly Gln Ile Pro Ser Cys Leu Lys
        115             120             125

Gly Val Tyr Ile Arg Asn Gly Ala Asn Pro Met Phe Pro Pro Leu Ala
    130             135             140

Gly His His Leu Phe Asp Gly Asp Gly Met Ile His Ala Val Ser Ile
145             150             155             160

Gly Phe Asp Asn Gln Val Ser Tyr Ser Cys Arg Tyr Thr Lys Thr Asn
            165             170             175

Arg Leu Val Gln Glu Thr Ala Leu Gly Arg Ser Val Phe Pro Lys Pro
            180             185             190

Ile Gly Glu Leu His Gly His Ser Gly Leu Ala Arg Leu Ala Leu Phe
    195             200             205

Thr Ala Arg Ala Gly Ile Gly Leu Val Asp Gly Thr Arg Gly Met Gly
    210             215             220

Val Ala Asn Ala Gly Val Val Phe Phe Asn Gly Arg Leu Leu Ala Met
225             230             235             240

Ser Glu Asp Asp Leu Pro Tyr Gln Val Lys Ile Asp Gly Gln Gly Asp
            245             250             255

Leu Glu Thr Ile Gly Arg Phe Gly Phe Asp Asp Gln Ile Asp Ser Ser
            260             265             270

Val Ile Ala His Pro Lys Val Asp Ala Thr Thr Gly Asp Leu His Thr
            275             280             285

Leu Ser Tyr Asn Val Leu Lys Lys Pro His Leu Arg Tyr Leu Lys Phe
    290             295             300

Asn Thr Cys Gly Lys Lys Thr Arg Asp Val Glu Ile Thr Leu Pro Glu
305             310             315             320

Pro Thr Met Ile His Asp Phe Ala Ile Thr Glu Asn Phe Val Val Ile
            325             330             335

Pro Asp Gln Gln Met Val Phe Lys Leu Ser Glu Met Ile Arg Gly Gly
            340             345             350

Ser Pro Val Ile Tyr Val Lys Glu Lys Met Ala Arg Phe Gly Val Leu
            355             360             365

Ser Lys Gln Asp Leu Thr Gly Ser Asp Ile Asn Trp Val Asp Val Pro
            370             375             380

Asp Cys Phe Cys Phe His Leu Trp Asn Ala Trp Glu Glu Arg Thr Glu
385             390             395             400

Glu Gly Asp Pro Val Ile Val Val Ile Gly Ser Cys Met Ser Pro Pro
            405             410             415
```

```
Asp Thr Ile Phe Ser Glu Ser Gly Glu Pro Thr Arg Val Glu Leu Ser
            420             425             430

Glu Ile Arg Leu Asn Met Arg Thr Lys Glu Ser Asn Arg Lys Val Ile
        435             440             445

Val Thr Gly Val Asn Leu Glu Ala Gly His Ile Asn Arg Ser Tyr Val
    450             455             460

Gly Arg Lys Ser Gln Phe Val Tyr Ile Ala Ile Ala Asp Pro Trp Pro
465             470             475             480

Lys Cys Ser Gly Ile Ala Lys Val Asp Ile Gln Asn Gly Thr Val Ser
            485             490             495

Glu Phe Asn Tyr Gly Pro Ser Arg Phe Gly Gly Glu Pro Cys Phe Val
            500             505             510

Pro Glu Gly Glu Gly Glu Glu Asp Lys Gly Tyr Val Met Gly Phe Val
            515             520             525

Arg Asp Glu Glu Lys Asp Glu Ser Glu Phe Val Val Val Asp Ala Thr
    530             535             540

Asp Met Lys Gln Val Ala Ala Val Arg Leu Pro Glu Arg Val Pro Tyr
545             550             555             560

Gly Phe His Gly Thr Phe Val Ser Glu Asn Gln Leu Lys Glu Gln Val
            565             570             575

Phe


<210> 11
<211> 1839
<212> DNA
<213> Vigna unguiculata

<220>
<221> CDS
<222> (1)..(1836)

<400> 11
atg cct tca tca gct tca aac act tgg ttt aac gcc aca ctc cca tct      48
Met Pro Ser Ser Ala Ser Asn Thr Trp Phe Asn Ala Thr Leu Pro Ser
 1               5                  10                  15

ccc ccc ttc aaa gac cta cct tcc aca tct tct ccc aca aac tta ctt      96
Pro Pro Phe Lys Asp Leu Pro Ser Thr Ser Ser Pro Thr Asn Leu Leu
            20                  25                  30

cct tta agg aaa aca tcc tct tcc aac acc atc aca tgt tcc ctt caa     144
Pro Leu Arg Lys Thr Ser Ser Ser Asn Thr Ile Thr Cys Ser Leu Gln
        35                  40                  45

aca ctc cac ttc ccc aaa cag tac caa cca aca tcc aca tcc aca tcc     192
Thr Leu His Phe Pro Lys Gln Tyr Gln Pro Thr Ser Thr Ser Thr Ser
    50                  55                  60
```

```
aca gcc acc acc aca aca ccc acc cca atc aaa act acc acc atc acc    240
Thr Ala Thr Thr Thr Thr Pro Thr Pro Ile Lys Thr Thr Thr Ile Thr
65                  70                  75                  80

acc acc aca ccg ccc agg gaa acc aac cct ctc tct gac acc aac caa    288
Thr Thr Thr Pro Pro Arg Glu Thr Asn Pro Leu Ser Asp Thr Asn Gln
             85                  90                  95

cca tta cct caa aaa tgg aac ttt ctc cag aaa gcc gct gcc acg gcc    336
Pro Leu Pro Gln Lys Trp Asn Phe Leu Gln Lys Ala Ala Ala Thr Ala
             100                 105                 110

ttg gac ctg gtc gaa acg gcg ctc gtc tcg cac gag cgc aaa cac ccg    384
Leu Asp Leu Val Glu Thr Ala Leu Val Ser His Glu Arg Lys His Pro
             115                 120                 125

ctc ccc aaa acg gcg gac ccg agg gtc caa atc gcc ggg aac ttc gcg    432
Leu Pro Lys Thr Ala Asp Pro Arg Val Gln Ile Ala Gly Asn Phe Ala
         130                 135                 140

ccg gtg ccg gag cat gcc gcg gat caa gga ctc ccg gtg gtc gga aaa    480
Pro Val Pro Glu His Ala Ala Asp Gln Gly Leu Pro Val Val Gly Lys
145                 150                 155                 160

atc ccc aaa tgc att gac ggc gtg tac gtg cgc aac ggt gcc aat ccg    528
Ile Pro Lys Cys Ile Asp Gly Val Tyr Val Arg Asn Gly Ala Asn Pro
                 165                 170                 175

ctc tac gag cct gtg gcc ggg cac cac ttc ttc gac ggc gac ggc atg    576
Leu Tyr Glu Pro Val Ala Gly His His Phe Phe Asp Gly Asp Gly Met
             180                 185                 190

gtc cac gcc gtg aag ttc acg aac ggc gcc gcc agc tac gcc tgc cgc    624
Val His Ala Val Lys Phe Thr Asn Gly Ala Ala Ser Tyr Ala Cys Arg
         195                 200                 205

ttc acc gag acg cag cgt ctc tcg cag gag aaa tct cta ggc cgc ccg    672
Phe Thr Glu Thr Gln Arg Leu Ser Gln Glu Lys Ser Leu Gly Arg Pro
     210                 215                 220

gtg ttc ccg aag gcc atc ggg gag ctc cac ggc cac tcc ggc atc gcg    720
Val Phe Pro Lys Ala Ile Gly Glu Leu His Gly His Ser Gly Ile Ala
225                 230                 235                 240

cgg ctc ctc ctc ttc tac gcg cgc ggt ctc ttc ggg ctc gtt gat ggg    768
Arg Leu Leu Leu Phe Tyr Ala Arg Gly Leu Phe Gly Leu Val Asp Gly
             245                 250                 255

tcc cag ggc atg ggc gtg gcg aac gcc ggt ctc gtc tac ttc aac aac    816
Ser Gln Gly Met Gly Val Ala Asn Ala Gly Leu Val Tyr Phe Asn Asn
             260                 265                 270

cac ctc ttg gcc atg tcc gaa gac gat tta ccc tac cac gtg aga atc    864
His Leu Leu Ala Met Ser Glu Asp Asp Leu Pro Tyr His Val Arg Ile
         275                 280                 285
```

```
acc cct aac ggc gac tta acc acc gtt ggc cgt tac gac ttc aac ggg       912
Thr Pro Asn Gly Asp Leu Thr Thr Val Gly Arg Tyr Asp Phe Asn Gly
    290             295             300

cag ctc aac tca aca atg atc gcc cac ccg aaa ctg gac ccc gtc gac       960
Gln Leu Asn Ser Thr Met Ile Ala His Pro Lys Leu Asp Pro Val Asp
305             310             315             320

ggc gac ctc cac gcg ctc agc tac gac gtc att cag aag cct tac ctc      1008
Gly Asp Leu His Ala Leu Ser Tyr Asp Val Ile Gln Lys Pro Tyr Leu
            325             330             335

aag tac ttc cgt ttc tcc ccc gac ggc gtc aag tcc ccc gac gtg gaa      1056
Lys Tyr Phe Arg Phe Ser Pro Asp Gly Val Lys Ser Pro Asp Val Glu
            340             345             350

atc ccc ctg aag gag ccc acc atg atg cac gat ttc gcc ata acg gag      1104
Ile Pro Leu Lys Glu Pro Thr Met Met His Asp Phe Ala Ile Thr Glu
            355             360             365

aat ttc gtc gtc gtc ccc gac cag cag gtg gtc ttc aaa cta acg gag      1152
Asn Phe Val Val Val Pro Asp Gln Gln Val Val Phe Lys Leu Thr Glu
            370             375             380

atg atc acc ggc ggg tcc ccc gtg gtc tac gac aag aac aaa acc tca      1200
Met Ile Thr Gly Gly Ser Pro Val Val Tyr Asp Lys Asn Lys Thr Ser
385             390             395             400

cgg ttt ggg att ctg cac aag aat gcg aag gac gcg aat gcg atg cgg      1248
Arg Phe Gly Ile Leu His Lys Asn Ala Lys Asp Ala Asn Ala Met Arg
                405             410             415

tgg atc gac gcg ccg gat tgt ttc tgc ttc cac ctc tgg aac gcg tgg      1296
Trp Ile Asp Ala Pro Asp Cys Phe Cys Phe His Leu Trp Asn Ala Trp
            420             425             430

gag gag ccc gaa acc gag gag gtt gtg gtg att ggg tcc tgc atg acc      1344
Glu Glu Pro Glu Thr Glu Glu Val Val Val Ile Gly Ser Cys Met Thr
            435             440             445

cct gcg gac tcc att ttc aac gaa tgc gag gag agt ttg aag agc gtg      1392
Pro Ala Asp Ser Ile Phe Asn Glu Cys Glu Glu Ser Leu Lys Ser Val
            450             455             460

ctg tca gag ata agg ctg aac ttg agg acc ggc aag tcc act cgg cgc      1440
Leu Ser Glu Ile Arg Leu Asn Leu Arg Thr Gly Lys Ser Thr Arg Arg
465             470             475             480

ccc att atc tcc gac gcc gaa caa gtg aac ctg gaa gcc ggc atg gtg      1488
Pro Ile Ile Ser Asp Ala Glu Gln Val Asn Leu Glu Ala Gly Met Val
                485             490             495

aac aga aac aag ctc gga agg aag acc cag ttc gcg tat ctg gct ctg      1536
Asn Arg Asn Lys Leu Gly Arg Lys Thr Gln Phe Ala Tyr Leu Ala Leu
            500             505             510
```

```
gcg gag ccc tgg ccc aaa gtc tcg ggc ttt gcg aaa gtt gat ttg ctg    1584
Ala Glu Pro Trp Pro Lys Val Ser Gly Phe Ala Lys Val Asp Leu Leu
        515                 520                 525

agt ggg gaa gtg aag aag tac atg tat gga gaa gag aag ttc ggt ggg    1632
Ser Gly Glu Val Lys Lys Tyr Met Tyr Gly Glu Glu Lys Phe Gly Gly
        530                 535                 540

gag cct ctg ttt ctt ccc aac ggc caa aaa gaa gac gat ggg tat att    1680
Glu Pro Leu Phe Leu Pro Asn Gly Gln Lys Glu Asp Asp Gly Tyr Ile
545                 550                 555                 560

ctg gca ttc gtg cac gac gag aaa gaa tgg aaa tcc gag ctg cag att    1728
Leu Ala Phe Val His Asp Glu Lys Glu Trp Lys Ser Glu Leu Gln Ile
                565                 570                 575

gtg aat gcc caa aat tta aag ctc gaa gct tcc atc aaa ctc ccc tct    1776
Val Asn Ala Gln Asn Leu Lys Leu Glu Ala Ser Ile Lys Leu Pro Ser
                580                 585                 590

cgt gtt ccc tac ggt ttt cat gga act ttc att cat tcc aag gat ttg    1824
Arg Val Pro Tyr Gly Phe His Gly Thr Phe Ile His Ser Lys Asp Leu
        595                 600                 605

agg aaa caa gct tga                                                 1839
Arg Lys Gln Ala
    610
```

<210> 12
<211> 612
<212> PRT
<213> Vigna unguiculata

<400> 12

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Met Pro Ser Ser Ala Ser Asn Thr Trp Phe Asn Ala Thr Leu Pro Ser
 1               5                  10                  15

Pro Pro Phe Lys Asp Leu Pro Ser Thr Ser Ser Pro Thr Asn Leu Leu
            20                  25                  30

Pro Leu Arg Lys Thr Ser Ser Ser Asn Thr Ile Thr Cys Ser Leu Gln
            35                  40                  45

Thr Leu His Phe Pro Lys Gln Tyr Gln Pro Thr Ser Thr Ser Thr Ser
    50                  55                  60

Thr Ala Thr Thr Thr Thr Pro Thr Pro Ile Lys Thr Thr Thr Ile Thr
65                  70                  75                  80

Thr Thr Thr Pro Pro Arg Glu Thr Asn Pro Leu Ser Asp Thr Asn Gln
                85                  90                  95

Pro Leu Pro Gln Lys Trp Asn Phe Leu Gln Lys Ala Ala Ala Thr Ala
                100                 105                 110

Leu Asp Leu Val Glu Thr Ala Leu Val Ser His Glu Arg Lys His Pro
            115                 120                 125
```

Leu Pro Lys Thr Ala Asp Pro Arg Val Gln Ile Ala Gly Asn Phe Ala
    130   135   140

Pro Val Pro Glu His Ala Ala Asp Gln Gly Leu Pro Val Val Gly Lys
145   150   155   160

Ile Pro Lys Cys Ile Asp Gly Val Tyr Val Arg Asn Gly Ala Asn Pro
        165   170   175

Leu Tyr Glu Pro Val Ala Gly His His Phe Phe Asp Gly Asp Gly Met
        180   185   190

Val His Ala Val Lys Phe Thr Asn Gly Ala Ala Ser Tyr Ala Cys Arg
        195   200   205

Phe Thr Glu Thr Gln Arg Leu Ser Gln Glu Lys Ser Leu Gly Arg Pro
        210   215   220

Val Phe Pro Lys Ala Ile Gly Glu Leu His Gly His Ser Gly Ile Ala
225   230   235   240

Arg Leu Leu Leu Phe Tyr Ala Arg Gly Leu Phe Gly Leu Val Asp Gly
        245   250   255

Ser Gln Gly Met Gly Val Ala Asn Ala Gly Leu Val Tyr Phe Asn Asn
        260   265   270

His Leu Leu Ala Met Ser Glu Asp Asp Leu Pro Tyr His Val Arg Ile
        275   280   285

Thr Pro Asn Gly Asp Leu Thr Thr Val Gly Arg Tyr Asp Phe Asn Gly
        290   295   300

Gln Leu Asn Ser Thr Met Ile Ala His Pro Lys Leu Asp Pro Val Asp
305   310   315   320

Gly Asp Leu His Ala Leu Ser Tyr Asp Val Ile Gln Lys Pro Tyr Leu
        325   330   335

Lys Tyr Phe Arg Phe Ser Pro Asp Gly Val Lys Ser Pro Asp Val Glu
        340   345   350

Ile Pro Leu Lys Glu Pro Thr Met Met His Asp Phe Ala Ile Thr Glu
        355   360   365

Asn Phe Val Val Val Pro Asp Gln Gln Val Val Phe Lys Leu Thr Glu
        370   375   380

Met Ile Thr Gly Gly Ser Pro Val Val Tyr Asp Lys Asn Lys Thr Ser
385   390   395   400

Arg Phe Gly Ile Leu His Lys Asn Ala Lys Asp Ala Asn Ala Met Arg
        405   410   415

Trp Ile Asp Ala Pro Asp Cys Phe Cys Phe His Leu Trp Asn Ala Trp
        420   425   430

```
Glu Glu Pro Glu Thr Glu Glu Val Val Val Ile Gly Ser Cys Met Thr
        435             440             445

Pro Ala Asp Ser Ile Phe Asn Glu Cys Glu Glu Ser Leu Lys Ser Val
    450             455             460

Leu Ser Glu Ile Arg Leu Asn Leu Arg Thr Gly Lys Ser Thr Arg Arg
465             470             475             480

Pro Ile Ile Ser Asp Ala Glu Gln Val Asn Leu Glu Ala Gly Met Val
            485             490             495

Asn Arg Asn Lys Leu Gly Arg Lys Thr Gln Phe Ala Tyr Leu Ala Leu
        500             505             510

Ala Glu Pro Trp Pro Lys Val Ser Gly Phe Ala Lys Val Asp Leu Leu
    515             520             525

Ser Gly Glu Val Lys Lys Tyr Met Tyr Gly Glu Glu Lys Phe Gly Gly
    530             535             540

Glu Pro Leu Phe Leu Pro Asn Gly Gln Lys Glu Asp Asp Gly Tyr Ile
545             550             555             560

Leu Ala Phe Val His Asp Glu Lys Glu Trp Lys Ser Glu Leu Gln Ile
            565             570             575

Val Asn Ala Gln Asn Leu Lys Leu Glu Ala Ser Ile Lys Leu Pro Ser
        580             585             590

Arg Val Pro Tyr Gly Phe His Gly Thr Phe Ile His Ser Lys Asp Leu
    595             600             605

Arg Lys Gln Ala
    610


<210> 13
<211> 1815
<212> DNA
<213> Zea mays

<220>
<221> CDS
<222> (1)..(1812)

<400> 13
atg cag ggt ctc gcc ccg ccc acc tct gtt tcc ata cac cgg cac ctg    48
Met Gln Gly Leu Ala Pro Pro Thr Ser Val Ser Ile His Arg His Leu
 1               5                  10                  15

ccg gcc cgg tcc agg gcc cgg gcc tcc aat tcc gtc agg ttc tcg ccg    96
Pro Ala Arg Ser Arg Ala Arg Ala Ser Asn Ser Val Arg Phe Ser Pro
                20                  25                  30

cgc gcc gtc agc tcc gtg ccg ccc gcc gag tgc ctc cag gcg ccg ttc   144
Arg Ala Val Ser Ser Val Pro Pro Ala Glu Cys Leu Gln Ala Pro Phe
            35                  40                  45
```

```
cac aag ccc gtc gcc gac ctg cct gcg ccg tcc agg aag ccc gcc gcc    192
His Lys Pro Val Ala Asp Leu Pro Ala Pro Ser Arg Lys Pro Ala Ala
        50                  55                  60

att gcc gtc cca ggg cac gcc gcg gcg ccg agg aaa gcg gag ggc ggc    240
Ile Ala Val Pro Gly His Ala Ala Ala Pro Arg Lys Ala Glu Gly Gly
65                  70                  75                  80

aag aag cag ctc aac ttg ttc cag cgc gcc gcg gcg gcc gcg ctc gac    288
Lys Lys Gln Leu Asn Leu Phe Gln Arg Ala Ala Ala Ala Ala Leu Asp
                85                  90                  95

gcg ttc gag gaa ggg ttc gtg gcc aac gtc ctc gag cgg ccc cac ggg    336
Ala Phe Glu Glu Gly Phe Val Ala Asn Val Leu Glu Arg Pro His Gly
                100                 105                 110

ctg ccc agc acg gcc gac ccg gcc gtg cag atc gcc ggc aac ttc gcg    384
Leu Pro Ser Thr Ala Asp Pro Ala Val Gln Ile Ala Gly Asn Phe Ala
            115                 120                 125

ccc gtc ggg gag agg ccg ccc gtg cac gag ctc ccc gtc tcc ggc cgc    432
Pro Val Gly Glu Arg Pro Pro Val His Glu Leu Pro Val Ser Gly Arg
        130                 135                 140

atc ccg ccc ttc atc gac ggg gtc tac gcg cgc aac ggc gcc aac ccc    480
Ile Pro Pro Phe Ile Asp Gly Val Tyr Ala Arg Asn Gly Ala Asn Pro
145                 150                 155                 160

tgc ttc gac ccc gtc gcg ggg cac cac ctc ttc gac ggc gac ggc atg    528
Cys Phe Asp Pro Val Ala Gly His His Leu Phe Asp Gly Asp Gly Met
                165                 170                 175

gtg cac gcg ctg cgg ata cgc aac ggc gcc gcc gag tcc tac gcc tgc    576
Val His Ala Leu Arg Ile Arg Asn Gly Ala Ala Glu Ser Tyr Ala Cys
                180                 185                 190

cgc ttc acg gag acc gcg cgc ctg cgc cag gag cgc gcg atc ggc cgc    624
Arg Phe Thr Glu Thr Ala Arg Leu Arg Gln Glu Arg Ala Ile Gly Arg
            195                 200                 205

ccc gtc ttc ccc aag gcc att ggc gag ctg cac ggg cac tcc ggg atc    672
Pro Val Phe Pro Lys Ala Ile Gly Glu Leu His Gly His Ser Gly Ile
        210                 215                 220

gcg cgc ctc gcc ctg ttc tac gcg cgc gcc gcg tgc ggc ctc gtg gac    720
Ala Arg Leu Ala Leu Phe Tyr Ala Arg Ala Ala Cys Gly Leu Val Asp
225                 230                 235                 240

ccc tcg gcc ggc acc ggc gtg gcc aac gcc ggc ctc gtc tac ttc aac    768
Pro Ser Ala Gly Thr Gly Val Ala Asn Ala Gly Leu Val Tyr Phe Asn
                245                 250                 255

ggc cgc ctg ctc gcc atg tcc gag gac gac ctc ccc tac cac gtc cgc    816
Gly Arg Leu Leu Ala Met Ser Glu Asp Asp Leu Pro Tyr His Val Arg
            260                 265                 270
```

```
gtg gcg gac gac ggc gac ctc gag acc gtc ggc cgc tac gac ttc gac     864
Val Ala Asp Asp Gly Asp Leu Glu Thr Val Gly Arg Tyr Asp Phe Asp
        275                 280                 285

ggg cag ctc ggc tgc gcc atg atc gcg cac ccc aag ctg gac ccg gcc     912
Gly Gln Leu Gly Cys Ala Met Ile Ala His Pro Lys Leu Asp Pro Ala
        290                 295                 300

acc ggg gag ctc cac gcg ctc agc tac gac gtc atc aag agg ccg tac     960
Thr Gly Glu Leu His Ala Leu Ser Tyr Asp Val Ile Lys Arg Pro Tyr
305                 310                 315                 320

ctc aag tac ttc tac ttc agg ccc gac ggc acc aag tcc gac gac gtg    1008
Leu Lys Tyr Phe Tyr Phe Arg Pro Asp Gly Thr Lys Ser Asp Asp Val
                325                 330                 335

gag atc ccg ctg gag cag ccc acg atg atc cac gac ttc gcc atc acc    1056
Glu Ile Pro Leu Glu Gln Pro Thr Met Ile His Asp Phe Ala Ile Thr
                340                 345                 350

gag aac ttc gtg gtt gtg ccc gac cac cag gtg gtg ttc aag ctc cag    1104
Glu Asn Phe Val Val Val Pro Asp His Gln Val Val Phe Lys Leu Gln
                355                 360                 365

gag atg ctg cgc ggc ggg tcg ccc gtg gtg ctg gac aag gag aag acg    1152
Glu Met Leu Arg Gly Gly Ser Pro Val Val Leu Asp Lys Glu Lys Thr
        370                 375                 380

tcg cgg ttc ggc gtg ctc ccc aag cac gcc gcg gac gcg tcg gag atg    1200
Ser Arg Phe Gly Val Leu Pro Lys His Ala Ala Asp Ala Ser Glu Met
385                 390                 395                 400

gcg tgg gtg gac gtg ccg gac tgc ttc tgc ttc cac ctg tgg aac gcg    1248
Ala Trp Val Asp Val Pro Asp Cys Phe Cys Phe His Leu Trp Asn Ala
                405                 410                 415

tgg gag gac gag gcg acg ggc gag gtg gtg gtg atc ggc tcc tgc atg    1296
Trp Glu Asp Glu Ala Thr Gly Glu Val Val Val Ile Gly Ser Cys Met
                420                 425                 430

acc ccc gcc gac tcc atc ttc aac gag tcc gac gag cgc ctg gag agc    1344
Thr Pro Ala Asp Ser Ile Phe Asn Glu Ser Asp Glu Arg Leu Glu Ser
                435                 440                 445

gtg ctg acc gag atc cgc ctg gac gcg cgc acg ggc cgg tcc acg cgc    1392
Val Leu Thr Glu Ile Arg Leu Asp Ala Arg Thr Gly Arg Ser Thr Arg
        450                 455                 460

cgc gcc gtc ctg ccg ccg tcg cag cag gag aac ctg gag gtg ggc atg    1440
Arg Ala Val Leu Pro Pro Ser Gln Gln Glu Asn Leu Glu Val Gly Met
465                 470                 475                 480

gtg aac cgc aac ctg ctg ggc cgc gag agc cgg tac gcg tac ctc gcg    1488
Val Asn Arg Asn Leu Leu Gly Arg Glu Ser Arg Tyr Ala Tyr Leu Ala
                485                 490                 495
```

```
gtg gcg gag ccg tgg ccc aag gag tcg ggc ttc gcc aag gag gac ctg     1536
Val Ala Glu Pro Trp Pro Lys Glu Ser Gly Phe Ala Lys Glu Asp Leu
            500                 505                 510

tcc acg ggc gag ctc acc aag ttc gag tac ggc gag ggc cgg ttc ggc     1584
Ser Thr Gly Glu Leu Thr Lys Phe Glu Tyr Gly Glu Gly Arg Phe Gly
            515                 520                 525

ggc gag ccc tgc ttc gtt ccc atg gac ccg gcc gcg gcc cac ccg cgc     1632
Gly Glu Pro Cys Phe Val Pro Met Asp Pro Ala Ala Ala His Pro Arg
            530                 535                 540

ggc gag gac gac ggg tac gtg ctc acc ttc gtc cac gac gag cgc gcc     1680
Gly Glu Asp Asp Gly Tyr Val Leu Thr Phe Val His Asp Glu Arg Ala
545                 550                 555                 560

ggc acg tcg gag cta ctt gtg gtc aat gcc gcc gac atc cgg ctg gag     1728
Gly Thr Ser Glu Leu Leu Val Val Asn Ala Ala Asp Ile Arg Leu Glu
            565                 570                 575

gcc acg gtt cag ctg ccg tcc cgc gtg ccc ttc ggc ttc cac ggc acc     1776
Ala Thr Val Gln Leu Pro Ser Arg Val Pro Phe Gly Phe His Gly Thr
            580                 585                 590

ttc atc acg ggc cag gag ctc gag gcc cag gcg gcc tga                 1815
Phe Ile Thr Gly Gln Glu Leu Glu Ala Gln Ala Ala
            595                 600
```

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<210>  14
<211>  604
<212>  PRT
<213>  Zea mays

<400>  14
Met Gln Gly Leu Ala Pro Pro Thr Ser Val Ser Ile His Arg His Leu
  1               5                  10                  15

Pro Ala Arg Ser Arg Ala Arg Ala Ser Asn Ser Val Arg Phe Ser Pro
               20                  25                  30

Arg Ala Val Ser Ser Val Pro Pro Ala Glu Cys Leu Gln Ala Pro Phe
               35                  40                  45

His Lys Pro Val Ala Asp Leu Pro Ala Pro Ser Arg Lys Pro Ala Ala
        50                  55                  60

Ile Ala Val Pro Gly His Ala Ala Ala Pro Arg Lys Ala Glu Gly Gly
 65                  70                  75                  80

Lys Lys Gln Leu Asn Leu Phe Gln Arg Ala Ala Ala Ala Ala Leu Asp
                85                  90                  95

Ala Phe Glu Glu Gly Phe Val Ala Asn Val Leu Glu Arg Pro His Gly
               100                 105                 110

Leu Pro Ser Thr Ala Asp Pro Ala Val Gln Ile Ala Gly Asn Phe Ala
               115                 120                 125
```

Pro Val Gly Glu Arg Pro Pro Val His Glu Leu Pro Val Ser Gly Arg
    130   135   140

Ile Pro Pro Phe Ile Asp Gly Val Tyr Ala Arg Asn Gly Ala Asn Pro
145   150   155   160

Cys Phe Asp Pro Val Ala Gly His His Leu Phe Asp Gly Asp Gly Met
            165   170   175

Val His Ala Leu Arg Ile Arg Asn Gly Ala Ala Glu Ser Tyr Ala Cys
        180   185   190

Arg Phe Thr Glu Thr Ala Arg Leu Arg Gln Glu Arg Ala Ile Gly Arg
        195   200   205

Pro Val Phe Pro Lys Ala Ile Gly Glu Leu His Gly His Ser Gly Ile
    210   215   220

Ala Arg Leu Ala Leu Phe Tyr Ala Arg Ala Ala Cys Gly Leu Val Asp
225   230   235   240

Pro Ser Ala Gly Thr Gly Val Ala Asn Ala Gly Leu Val Tyr Phe Asn
            245   250   255

Gly Arg Leu Leu Ala Met Ser Glu Asp Asp Leu Pro Tyr His Val Arg
        260   265   270

Val Ala Asp Asp Gly Asp Leu Glu Thr Val Gly Arg Tyr Asp Phe Asp
        275   280   285

Gly Gln Leu Gly Cys Ala Met Ile Ala His Pro Lys Leu Asp Pro Ala
    290   295   300

Thr Gly Glu Leu His Ala Leu Ser Tyr Asp Val Ile Lys Arg Pro Tyr
305   310   315   320

Leu Lys Tyr Phe Tyr Phe Arg Pro Asp Gly Thr Lys Ser Asp Asp Val
            325   330   335

Glu Ile Pro Leu Glu Gln Pro Thr Met Ile His Asp Phe Ala Ile Thr
            340   345   350

Glu Asn Phe Val Val Val Pro Asp His Gln Val Val Phe Lys Leu Gln
        355   360   365

Glu Met Leu Arg Gly Gly Ser Pro Val Val Leu Asp Lys Glu Lys Thr
    370   375   380

Ser Arg Phe Gly Val Leu Pro Lys His Ala Ala Asp Ala Ser Glu Met
385   390   395   400

Ala Trp Val Asp Val Pro Asp Cys Phe Cys Phe His Leu Trp Asn Ala
            405   410   415

Trp Glu Asp Glu Ala Thr Gly Glu Val Val Val Ile Gly Ser Cys Met
        420   425   430

```
Thr Pro Ala Asp Ser Ile Phe Asn Glu Ser Asp Glu Arg Leu Glu Ser
        435             440             445

Val Leu Thr Glu Ile Arg Leu Asp Ala Arg Thr Gly Arg Ser Thr Arg
        450             455             460

Arg Ala Val Leu Pro Pro Ser Gln Gln Glu Asn Leu Glu Val Gly Met
465             470             475             480

Val Asn Arg Asn Leu Leu Gly Arg Glu Ser Arg Tyr Ala Tyr Leu Ala
            485             490             495

Val Ala Glu Pro Trp Pro Lys Glu Ser Gly Phe Ala Lys Glu Asp Leu
            500             505             510

Ser Thr Gly Glu Leu Thr Lys Phe Glu Tyr Gly Glu Gly Arg Phe Gly
        515             520             525

Gly Glu Pro Cys Phe Val Pro Met Asp Pro Ala Ala Ala His Pro Arg
        530             535             540

Gly Glu Asp Asp Gly Tyr Val Leu Thr Phe Val His Asp Glu Arg Ala
545             550             555             560

Gly Thr Ser Glu Leu Leu Val Val Asn Ala Ala Asp Ile Arg Leu Glu
            565             570             575

Ala Thr Val Gln Leu Pro Ser Arg Val Pro Phe Gly Phe His Gly Thr
            580             585             590

Phe Ile Thr Gly Gln Glu Leu Glu Ala Gln Ala Ala
        595             600
```

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<210> 15
<211> 1818
<212> DNA
<213> Lycopersicon esculentum

<220>
<221> CDS
<222> (1)..(1815)

<400> 15
atg gca act act act tca cat gcc aca aat aca tgg att aag act aag    48
Met Ala Thr Thr Thr Ser His Ala Thr Asn Thr Trp Ile Lys Thr Lys
 1               5              10              15

ttg tca atg cca tca tca aag gag ttt ggt ttt gca tca aac tct att    96
Leu Ser Met Pro Ser Ser Lys Glu Phe Gly Phe Ala Ser Asn Ser Ile
            20              25              30

tct cta ctc aaa aat caa cat aat agg caa agt ctc aac att aat tcc   144
Ser Leu Leu Lys Asn Gln His Asn Arg Gln Ser Leu Asn Ile Asn Ser
            35              40              45
```

```
tct ctt caa gct cca cct ata ctt cat ttt cct aaa caa tct tca aat    192
Ser Leu Gln Ala Pro Pro Ile Leu His Phe Pro Lys Gln Ser Ser Asn
        50              55              60

tat caa aca cca aag aat aat aca att tca cac cca aaa caa gaa aac    240
Tyr Gln Thr Pro Lys Asn Asn Thr Ile Ser His Pro Lys Gln Glu Asn
65              70              75              80

aac aac tcc tct tct tct tca act tcc aag tgg aat tta gtg cag aaa    288
Asn Asn Ser Ser Ser Ser Ser Thr Ser Lys Trp Asn Leu Val Gln Lys
                85              90              95

gca gca gca atg gct tta gat gct gta gaa agt gct tta act aaa cat    336
Ala Ala Ala Met Ala Leu Asp Ala Val Glu Ser Ala Leu Thr Lys His
            100             105             110

gaa ctt gaa cac cct ttg ccg aaa aca gcc gac cca cga gtc cag att    384
Glu Leu Glu His Pro Leu Pro Lys Thr Ala Asp Pro Arg Val Gln Ile
        115             120             125

tct ggg aat ttt gct ccg gta ccg gaa aat cca gtc tgt caa tct ctt    432
Ser Gly Asn Phe Ala Pro Val Pro Glu Asn Pro Val Cys Gln Ser Leu
    130             135             140

ccg gtc acc gga aaa ata ccc aaa tgt gtt caa ggc gtt tac gtt cga    480
Pro Val Thr Gly Lys Ile Pro Lys Cys Val Gln Gly Val Tyr Val Arg
145             150             155             160

aac gga gct aac cct ctt ttt gaa cca acc gcc gga cac cat ttc ttc    528
Asn Gly Ala Asn Pro Leu Phe Glu Pro Thr Ala Gly His His Phe Phe
                165             170             175

gac ggc gac ggt atg gtt cac gcc gtt caa ttc aaa aat ggg tcg gct    576
Asp Gly Asp Gly Met Val His Ala Val Gln Phe Lys Asn Gly Ser Ala
            180             185             190

agt tac gct tgc cgt ttc act gaa aca gag agg ctt gtt caa gaa aaa    624
Ser Tyr Ala Cys Arg Phe Thr Glu Thr Glu Arg Leu Val Gln Glu Lys
            195             200             205

gct ttg ggt cgc cct gtt ttc cct aaa gcc att ggt gaa tta cat ggt    672
Ala Leu Gly Arg Pro Val Phe Pro Lys Ala Ile Gly Glu Leu His Gly
    210             215             220

cac tct gga att gca agg ctt atg ctg ttt tac gct cgt ggg ctc ttc    720
His Ser Gly Ile Ala Arg Leu Met Leu Phe Tyr Ala Arg Gly Leu Phe
225             230             235             240

gga ctt gtt gat cac agt aaa gga act ggt gtt gca aac gcc ggt tta    768
Gly Leu Val Asp His Ser Lys Gly Thr Gly Val Ala Asn Ala Gly Leu
            245             250             255

gtc tat ttc aat aac cga tta ctt gct atg tct gaa gat gat ttg cct    816
Val Tyr Phe Asn Asn Arg Leu Leu Ala Met Ser Glu Asp Asp Leu Pro
            260             265             270
```

```
tac cat gta aag gta aca ccc acc ggc gat ctt aaa aca gag ggt cga    864
Tyr His Val Lys Val Thr Pro Thr Gly Asp Leu Lys Thr Glu Gly Arg
            275             280             285

ttc gat ttc gac ggc cag cta aaa tcc acc atg ata gct cac cca aag    912
Phe Asp Phe Asp Gly Gln Leu Lys Ser Thr Met Ile Ala His Pro Lys
            290             295             300

ctc gac cca gtt tcc ggt gag cta ttt gct ctt agc tac gat gtg att    960
Leu Asp Pro Val Ser Gly Glu Leu Phe Ala Leu Ser Tyr Asp Val Ile
305             310             315             320

cag aag cca tac ctc aag tac ttc aga ttt tca aaa aat ggg gaa aaa   1008
Gln Lys Pro Tyr Leu Lys Tyr Phe Arg Phe Ser Lys Asn Gly Glu Lys
            325             330             335

tca aat gat gtt gaa att cca gtt gaa gac cca aca atg atg cat gat   1056
Ser Asn Asp Val Glu Ile Pro Val Glu Asp Pro Thr Met Met His Asp
            340             345             350

ttc gca att act gag aac ttc gtc gtc att cct gat caa caa gtc gtt   1104
Phe Ala Ile Thr Glu Asn Phe Val Val Ile Pro Asp Gln Gln Val Val
            355             360             365

ttc aag atg tct gaa atg atc cgt gga ggt tca ccg gtg gtt tac gac   1152
Phe Lys Met Ser Glu Met Ile Arg Gly Gly Ser Pro Val Val Tyr Asp
            370             375             380

aag aac aaa gtt tcc cga ttt ggt att ctg gat aag tac gcg aaa gat   1200
Lys Asn Lys Val Ser Arg Phe Gly Ile Leu Asp Lys Tyr Ala Lys Asp
385             390             395             400

ggg tct gat ttg aaa tgg gtt gaa gta cct gat tgt ttc tgt ttc cac   1248
Gly Ser Asp Leu Lys Trp Val Glu Val Pro Asp Cys Phe Cys Phe His
            405             410             415

ctc tgg aat gct tgg gaa gaa gca gaa aca gat gaa atc gtt gta att   1296
Leu Trp Asn Ala Trp Glu Glu Ala Glu Thr Asp Glu Ile Val Val Ile
            420             425             430

ggt tca tgt atg aca cca cca gac tcc att ttc aat gaa tgt gat gaa   1344
Gly Ser Cys Met Thr Pro Pro Asp Ser Ile Phe Asn Glu Cys Asp Glu
            435             440             445

ggg cta aag agt gtt tta tcc gaa atc cgt ctc aat ttg aaa aca ggg   1392
Gly Leu Lys Ser Val Leu Ser Glu Ile Arg Leu Asn Leu Lys Thr Gly
            450             455             460

aaa tca aca aga aaa tcc ata atc gaa aac ccg gat gaa caa gtg aat   1440
Lys Ser Thr Arg Lys Ser Ile Ile Glu Asn Pro Asp Glu Gln Val Asn
465             470             475             480

tta gaa gct gga atg gtg aac cga aac aaa ctc gga agg aaa aca gag   1488
Leu Glu Ala Gly Met Val Asn Arg Asn Lys Leu Gly Arg Lys Thr Glu
            485             490             495
```

```
tat gct tat ttg gct atc gct gaa cca tgg cca aaa gtt tct ggt ttt    1536
Tyr Ala Tyr Leu Ala Ile Ala Glu Pro Trp Pro Lys Val Ser Gly Phe
            500             505             510

gca aaa gta aac ctg ttc acc ggt gaa gtt gag aaa ttc att tat ggt    1584
Ala Lys Val Asn Leu Phe Thr Gly Glu Val Glu Lys Phe Ile Tyr Gly
            515             520             525

gac aac aaa tat ggt ggg gaa cct ctt ttt tta cca aga gac ccc aac    1632
Asp Asn Lys Tyr Gly Gly Glu Pro Leu Phe Leu Pro Arg Asp Pro Asn
            530             535             540

agc aag gaa gaa gac gat ggt tat att tta gct ttc gtt cac gat gag    1680
Ser Lys Glu Glu Asp Asp Gly Tyr Ile Leu Ala Phe Val His Asp Glu
545             550             555             560

aaa gaa tgg aaa tca gaa ctg caa att gtt aac gca atg agt ttg aag    1728
Lys Glu Trp Lys Ser Glu Leu Gln Ile Val Asn Ala Met Ser Leu Lys
                565             570             575

ttg gag gca act gtg aag ctt cca tca aga gtt cct tat gga ttt cat    1776
Leu Glu Ala Thr Val Lys Leu Pro Ser Arg Val Pro Tyr Gly Phe His
            580             585             590

gga aca ttc ata aac gcc aat gat ttg gca aat cag gca tga            1818
Gly Thr Phe Ile Asn Ala Asn Asp Leu Ala Asn Gln Ala
            595             600             605
```

```
<210> 16
<211> 605
<212> PRT
<213> Lycopersicon esculentum

<400> 16
Met Ala Thr Thr Thr Ser His Ala Thr Asn Thr Trp Ile Lys Thr Lys
 1               5               10                  15

Leu Ser Met Pro Ser Ser Lys Glu Phe Gly Phe Ala Ser Asn Ser Ile
            20              25              30

Ser Leu Leu Lys Asn Gln His Asn Arg Gln Ser Leu Asn Ile Asn Ser
            35              40              45

Ser Leu Gln Ala Pro Pro Ile Leu His Phe Pro Lys Gln Ser Ser Asn
        50              55              60

Tyr Gln Thr Pro Lys Asn Asn Thr Ile Ser His Pro Lys Gln Glu Asn
65              70              75              80

Asn Asn Ser Ser Ser Ser Ser Thr Ser Lys Trp Asn Leu Val Gln Lys
                85              90              95

Ala Ala Ala Met Ala Leu Asp Ala Val Glu Ser Ala Leu Thr Lys His
            100             105             110

Glu Leu Glu His Pro Leu Pro Lys Thr Ala Asp Pro Arg Val Gln Ile
            115             120             125
```

```
Ser Gly Asn Phe Ala Pro Val Pro Glu Asn Pro Val Cys Gln Ser Leu
    130                 135                 140

Pro Val Thr Gly Lys Ile Pro Lys Cys Val Gln Gly Val Tyr Val Arg
145                 150                 155                 160

Asn Gly Ala Asn Pro Leu Phe Glu Pro Thr Ala Gly His His Phe Phe
                165                 170                 175

Asp Gly Asp Gly Met Val His Ala Val Gln Phe Lys Asn Gly Ser Ala
                180                 185                 190

Ser Tyr Ala Cys Arg Phe Thr Glu Thr Glu Arg Leu Val Gln Glu Lys
            195                 200                 205

Ala Leu Gly Arg Pro Val Phe Pro Lys Ala Ile Gly Glu Leu His Gly
    210                 215                 220

His Ser Gly Ile Ala Arg Leu Met Leu Phe Tyr Ala Arg Gly Leu Phe
225                 230                 235                 240

Gly Leu Val Asp His Ser Lys Gly Thr Gly Val Ala Asn Ala Gly Leu
            245                 250                 255

Val Tyr Phe Asn Asn Arg Leu Leu Ala Met Ser Glu Asp Asp Leu Pro
            260                 265                 270

Tyr His Val Lys Val Thr Pro Thr Gly Asp Leu Lys Thr Glu Gly Arg
        275                 280                 285

Phe Asp Phe Asp Gly Gln Leu Lys Ser Thr Met Ile Ala His Pro Lys
    290                 295                 300

Leu Asp Pro Val Ser Gly Glu Leu Phe Ala Leu Ser Tyr Asp Val Ile
305                 310                 315                 320

Gln Lys Pro Tyr Leu Lys Tyr Phe Arg Phe Ser Lys Asn Gly Glu Lys
                325                 330                 335

Ser Asn Asp Val Glu Ile Pro Val Glu Asp Pro Thr Met Met His Asp
            340                 345                 350

Phe Ala Ile Thr Glu Asn Phe Val Val Ile Pro Asp Gln Gln Val Val
            355                 360                 365

Phe Lys Met Ser Glu Met Ile Arg Gly Gly Ser Pro Val Val Tyr Asp
    370                 375                 380

Lys Asn Lys Val Ser Arg Phe Gly Ile Leu Asp Lys Tyr Ala Lys Asp
385                 390                 395                 400

Gly Ser Asp Leu Lys Trp Val Glu Val Pro Asp Cys Phe Cys Phe His
            405                 410                 415

Leu Trp Asn Ala Trp Glu Glu Ala Glu Thr Asp Glu Ile Val Val Ile
            420                 425                 430
```

```
Gly Ser Cys Met Thr Pro Pro Asp Ser Ile Phe Asn Glu Cys Asp Glu
        435             440             445
```

```
Gly Leu Lys Ser Val Leu Ser Glu Ile Arg Leu Asn Leu Lys Thr Gly
        450             455             460
```

```
Lys Ser Thr Arg Lys Ser Ile Ile Glu Asn Pro Asp Glu Gln Val Asn
465             470             475             480
```

```
Leu Glu Ala Gly Met Val Asn Arg Asn Lys Leu Gly Arg Lys Thr Glu
            485             490             495
```

```
Tyr Ala Tyr Leu Ala Ile Ala Glu Pro Trp Pro Lys Val Ser Gly Phe
        500             505             510
```

```
Ala Lys Val Asn Leu Phe Thr Gly Glu Val Glu Lys Phe Ile Tyr Gly
        515             520             525
```

```
Asp Asn Lys Tyr Gly Gly Glu Pro Leu Phe Leu Pro Arg Asp Pro Asn
        530             535             540
```

```
Ser Lys Glu Glu Asp Asp Gly Tyr Ile Leu Ala Phe Val His Asp Glu
545             550             555             560
```

```
Lys Glu Trp Lys Ser Glu Leu Gln Ile Val Asn Ala Met Ser Leu Lys
            565             570             575
```

```
Leu Glu Ala Thr Val Lys Leu Pro Ser Arg Val Pro Tyr Gly Phe His
            580             585             590
```

```
Gly Thr Phe Ile Asn Ala Asn Asp Leu Ala Asn Gln Ala
        595             600             605
```

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<210> 17
<211> 1617
<212> DNA
<213> Arabidopsis thaliana

<220>
<221> CDS
<222> (1)..(1614)

<400> 17
atg gcg gag aaa ctc agt gat ggc agc atc atc atc tca gtc cat cct    48
Met Ala Glu Lys Leu Ser Asp Gly Ser Ile Ile Ile Ser Val His Pro
 1               5              10                      15

aga ccc tcc aag ggt ttc tcc tcg aag ctt ctc gat ctt ctc gag aga    96
Arg Pro Ser Lys Gly Phe Ser Ser Lys Leu Leu Asp Leu Leu Glu Arg
                20              25                      30

ctt gtc gtc aag ctc atg cac gat gct tct ctc cct ctc cac tac ctc   144
Leu Val Val Lys Leu Met His Asp Ala Ser Leu Pro Leu His Tyr Leu
            35              40                      45
```

```
tca ggc aac ttc gct ccc atc cgt gat gaa act cct ccc gtc aag gat    192
Ser Gly Asn Phe Ala Pro Ile Arg Asp Glu Thr Pro Pro Val Lys Asp
    50                  55                  60

ctc ccc gtc cat gga ttt ctt ccc gaa tgc ttg aat ggt gaa ttt gtg    240
Leu Pro Val His Gly Phe Leu Pro Glu Cys Leu Asn Gly Glu Phe Val
65                  70                  75                  80

agg gtt ggt cca aac ccc aag ttt gat gct gtc gct gga tat cac tgg    288
Arg Val Gly Pro Asn Pro Lys Phe Asp Ala Val Ala Gly Tyr His Trp
                85                  90                  95

ttt gat gga gat ggg atg att cat ggg gta cgc atc aaa gat ggg aaa    336
Phe Asp Gly Asp Gly Met Ile His Gly Val Arg Ile Lys Asp Gly Lys
                100                 105                 110

gct act tat gtt tct cga tat gtt aag aca tca cgt ctt aag cag gaa    384
Ala Thr Tyr Val Ser Arg Tyr Val Lys Thr Ser Arg Leu Lys Gln Glu
            115                 120                 125

gag ttc ttc gga gct gcc aaa ttc atg aag att ggt gac ctt aag ggg    432
Glu Phe Phe Gly Ala Ala Lys Phe Met Lys Ile Gly Asp Leu Lys Gly
    130                 135                 140

ttt ttc gga ttg cta atg gtc aat atc caa cag ctg aga acg aag ctc    480
Phe Phe Gly Leu Leu Met Val Asn Ile Gln Gln Leu Arg Thr Lys Leu
145                 150                 155                 160

aaa ata ttg gac aac act tat gga aat gga act gcc aat aca gca ctc    528
Lys Ile Leu Asp Asn Thr Tyr Gly Asn Gly Thr Ala Asn Thr Ala Leu
                165                 170                 175

gta tat cac cat gga aaa ctt cta gca tta cag gag gca gat aag ccg    576
Val Tyr His His Gly Lys Leu Leu Ala Leu Gln Glu Ala Asp Lys Pro
            180                 185                 190

tac gtc atc aaa gtt ttg gaa gat gga gac ctg caa act ctt ggt ata    624
Tyr Val Ile Lys Val Leu Glu Asp Gly Asp Leu Gln Thr Leu Gly Ile
        195                 200                 205

ata gat tat gac aag aga ttg acc cac tcc ttc act gct cac cca aaa    672
Ile Asp Tyr Asp Lys Arg Leu Thr His Ser Phe Thr Ala His Pro Lys
    210                 215                 220

gtt gac ccg gtt acg ggt gaa atg ttt aca ttc ggc tat tcg cat acg    720
Val Asp Pro Val Thr Gly Glu Met Phe Thr Phe Gly Tyr Ser His Thr
225                 230                 235                 240

cca cct tat ctc aca tac aga gtt atc tcg aaa gat ggc att atg cat    768
Pro Pro Tyr Leu Thr Tyr Arg Val Ile Ser Lys Asp Gly Ile Met His
                245                 250                 255

gac cca gtc cca att act ata tca gag cct atc atg atg cat gat ttt    816
Asp Pro Val Pro Ile Thr Ile Ser Glu Pro Ile Met Met His Asp Phe
                260                 265                 270
```

```
gct att act gag act tat gca atc ttc atg gat ctt cct atg cac ttc    864
Ala Ile Thr Glu Thr Tyr Ala Ile Phe Met Asp Leu Pro Met His Phe
        275                 280                 285

agg cca aag gaa atg gtg aaa gag aag aaa atg ata tac tca ttt gat    912
Arg Pro Lys Glu Met Val Lys Glu Lys Lys Met Ile Tyr Ser Phe Asp
        290                 295                 300

ccc aca aaa aag gct cgt ttt ggt gtt ctt ccg cgc tat gcc aag gat    960
Pro Thr Lys Lys Ala Arg Phe Gly Val Leu Pro Arg Tyr Ala Lys Asp
305                 310                 315                 320

gaa ctt atg att aga tgg ttt gag ctt ccc aac tgc ttt att ttc cac   1008
Glu Leu Met Ile Arg Trp Phe Glu Leu Pro Asn Cys Phe Ile Phe His
                325                 330                 335

aac gcc aat gct tgg gaa gaa gag gat gaa gtc gtc ctc atc act tgt   1056
Asn Ala Asn Ala Trp Glu Glu Glu Asp Glu Val Val Leu Ile Thr Cys
                340                 345                 350

cgt ctt gag aat cca gat ctt gac atg gtc agt ggg aaa gtg aaa gaa   1104
Arg Leu Glu Asn Pro Asp Leu Asp Met Val Ser Gly Lys Val Lys Glu
                355                 360                 365

aaa ctc gaa aat ttt ggc aac gaa ctg tac gaa atg aga ttc aac atg   1152
Lys Leu Glu Asn Phe Gly Asn Glu Leu Tyr Glu Met Arg Phe Asn Met
        370                 375                 380

aaa acg ggc tca gct tct caa aaa aaa cta tcc gca tct gcg gtt gat   1200
Lys Thr Gly Ser Ala Ser Gln Lys Lys Leu Ser Ala Ser Ala Val Asp
385                 390                 395                 400

ttc ccc aga atc aat gag tgc tac acc gga aag aaa cag aga tac gta   1248
Phe Pro Arg Ile Asn Glu Cys Tyr Thr Gly Lys Lys Gln Arg Tyr Val
                405                 410                 415

tat gga aca att ctg gac agt atc gca aag gtt acc gga atc atc aag   1296
Tyr Gly Thr Ile Leu Asp Ser Ile Ala Lys Val Thr Gly Ile Ile Lys
                420                 425                 430

ttt gat ctg cat gca gaa gct gag aca ggg aaa aga atg ctg gaa gta   1344
Phe Asp Leu His Ala Glu Ala Glu Thr Gly Lys Arg Met Leu Glu Val
                435                 440                 445

gga ggt aat atc aaa gga ata tat gac ctg gga gaa ggc aga tat ggt   1392
Gly Gly Asn Ile Lys Gly Ile Tyr Asp Leu Gly Glu Gly Arg Tyr Gly
        450                 455                 460

tca gag gct atc tat gtt ccg cgt gag aca gca gaa gaa gac gac ggt   1440
Ser Glu Ala Ile Tyr Val Pro Arg Glu Thr Ala Glu Glu Asp Asp Gly
465                 470                 475                 480

tac ttg ata ttc ttt gtt cat gat gaa aac aca ggg aaa tca tgc gtg   1488
Tyr Leu Ile Phe Phe Val His Asp Glu Asn Thr Gly Lys Ser Cys Val
                485                 490                 495
```

```
act gtg ata gac gca aaa aca atg tcg gct gaa ccg gtg gca gtg gtg    1536
Thr Val Ile Asp Ala Lys Thr Met Ser Ala Glu Pro Val Ala Val Val
            500             505             510

gag ctg ccg cac agg gtc cca tat ggc ttc cat gcc ttg ttt gtt aca    1584
Glu Leu Pro His Arg Val Pro Tyr Gly Phe His Ala Leu Phe Val Thr
            515             520             525

gag gaa caa ctc cag gaa caa act ctt ata taa                        1617
Glu Glu Gln Leu Gln Glu Gln Thr Leu Ile
            530             535
```

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<210> 18
<211> 538
<212> PRT
<213> Arabidopsis thaliana

<400> 18
Met Ala Glu Lys Leu Ser Asp Gly Ser Ile Ile Ile Ser Val His Pro
 1               5                  10                  15

Arg Pro Ser Lys Gly Phe Ser Ser Lys Leu Leu Asp Leu Leu Glu Arg
                20                  25                  30

Leu Val Val Lys Leu Met His Asp Ala Ser Leu Pro Leu His Tyr Leu
            35                  40                  45

Ser Gly Asn Phe Ala Pro Ile Arg Asp Glu Thr Pro Pro Val Lys Asp
        50                  55                  60

Leu Pro Val His Gly Phe Leu Pro Glu Cys Leu Asn Gly Glu Phe Val
65                  70                  75                  80

Arg Val Gly Pro Asn Pro Lys Phe Asp Ala Val Ala Gly Tyr His Trp
                85                  90                  95

Phe Asp Gly Asp Gly Met Ile His Gly Val Arg Ile Lys Asp Gly Lys
                100                 105                 110

Ala Thr Tyr Val Ser Arg Tyr Val Lys Thr Ser Arg Leu Lys Gln Glu
            115                 120                 125

Glu Phe Phe Gly Ala Ala Lys Phe Met Lys Ile Gly Asp Leu Lys Gly
            130                 135                 140

Phe Phe Gly Leu Leu Met Val Asn Ile Gln Gln Leu Arg Thr Lys Leu
145                 150                 155                 160

Lys Ile Leu Asp Asn Thr Tyr Gly Asn Gly Thr Ala Asn Thr Ala Leu
                165                 170                 175

Val Tyr His His Gly Lys Leu Leu Ala Leu Gln Glu Ala Asp Lys Pro
            180                 185                 190

Tyr Val Ile Lys Val Leu Glu Asp Gly Asp Leu Gln Thr Leu Gly Ile
            195                 200                 205
```

```
Ile Asp Tyr Asp Lys Arg Leu Thr His Ser Phe Thr Ala His Pro Lys
    210             215             220
```

```
Val Asp Pro Val Thr Gly Glu Met Phe Thr Phe Gly Tyr Ser His Thr
225             230             235             240
```

```
Pro Pro Tyr Leu Thr Tyr Arg Val Ile Ser Lys Asp Gly Ile Met His
            245             250             255
```

```
Asp Pro Val Pro Ile Thr Ile Ser Glu Pro Ile Met Met His Asp Phe
            260             265             270
```

```
Ala Ile Thr Glu Thr Tyr Ala Ile Phe Met Asp Leu Pro Met His Phe
        275             280             285
```

```
Arg Pro Lys Glu Met Val Lys Glu Lys Lys Met Ile Tyr Ser Phe Asp
    290             295             300
```

```
Pro Thr Lys Lys Ala Arg Phe Gly Val Leu Pro Arg Tyr Ala Lys Asp
305             310             315             320
```

```
Glu Leu Met Ile Arg Trp Phe Glu Leu Pro Asn Cys Phe Ile Phe His
                325             330             335
```

```
Asn Ala Asn Ala Trp Glu Glu Glu Asp Glu Val Val Leu Ile Thr Cys
            340             345             350
```

```
Arg Leu Glu Asn Pro Asp Leu Asp Met Val Ser Gly Lys Val Lys Glu
            355             360             365
```

```
Lys Leu Glu Asn Phe Gly Asn Glu Leu Tyr Glu Met Arg Phe Asn Met
    370             375             380
```

```
Lys Thr Gly Ser Ala Ser Gln Lys Lys Leu Ser Ala Ser Ala Val Asp
385             390             395             400
```

```
Phe Pro Arg Ile Asn Glu Cys Tyr Thr Gly Lys Lys Gln Arg Tyr Val
            405             410             415
```

```
Tyr Gly Thr Ile Leu Asp Ser Ile Ala Lys Val Thr Gly Ile Ile Lys
            420             425             430
```

```
Phe Asp Leu His Ala Glu Ala Glu Thr Gly Lys Arg Met Leu Glu Val
    435             440             445
```

```
Gly Gly Asn Ile Lys Gly Ile Tyr Asp Leu Gly Glu Gly Arg Tyr Gly
    450             455             460
```

```
Ser Glu Ala Ile Tyr Val Pro Arg Glu Thr Ala Glu Glu Asp Asp Gly
465             470             475             480
```

```
Tyr Leu Ile Phe Phe Val His Asp Glu Asn Thr Gly Lys Ser Cys Val
            485             490             495
```

```
Thr Val Ile Asp Ala Lys Thr Met Ser Ala Glu Pro Val Ala Val Val
            500             505             510
```

Glu Leu Pro His Arg Val Pro Tyr Gly Phe His Ala Leu Phe Val Thr
        515   520   525

Glu Glu Gln Leu Gln Glu Gln Thr Leu Ile
    530   535

<210> 19
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 19
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<210> 20
<211> 31
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 20
attggatccc aaaagctaca cgctggtccc c   31

<210> 21
<211> 38
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

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<210> 22
<211> 36
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 22
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<210> 23
<211> 29
<212> DNA

<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 23
cccgggatcc ctcaagcctc tctataccg   29

<210> 24
<211> 31
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 24
cccgggatcc tttatacgga ttctgaggga g   31

<210> 25
<211> 33
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 25
attgaattca tggactctgt ttcttcttct tcc   33

<210> 26
<211> 34
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 26
attgaattct taaagcttat taaggtcact ttcc   34

<210> 27
<211> 35
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 27
aagaattcat ggcggagaaa ctcagtgatg gcagc   35

<210> 28
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<223> Description of Artificial Sequence: Primer

<400> 28
aaaagaattc ggcttatata agagtttgtt cctgg   35

<210> 29
<211> 39
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 29
cgggatccat gcaacactct cttcgttctg atcttcttc   39

<210> 30
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<212> DNA
<213> Artificial Sequence

<220>
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cgggatcctc agaaaacttg ttccttcaac tgattctcgc   40

<210> 31
<211> 32
<212> DNA
<213> Artificial Sequence

<220>
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<400> 31
attgaattca tggcttcttt cacggcaacg gc   32

<210> 32
<211> 17
<212> DNA
<213> Artificial Sequence

<220>
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<400> 32
gttttcccag tcacgac   17

<210> 33
<211> 538
<212> PRT
<213> Arabidopsis thaliana

<400> 33
```
Met Ala Glu Lys Leu Ser Asp Gly Ser Ile Ile Ile Ser Val His Pro
  1               5                  10                  15

Arg Pro Ser Lys Gly Phe Ser Ser Lys Leu Leu Asp Leu Leu Glu Arg
               20                  25                  30

Leu Val Val Lys Leu Met His Asp Ala Ser Leu Pro Leu His Tyr Leu
           35                  40                  45

Ser Gly Asn Phe Ala Pro Ile Arg Asp Glu Thr Pro Pro Val Lys Asp
       50                  55                  60

Leu Pro Val His Gly Phe Leu Pro Glu Cys Leu Asn Gly Glu Phe Val
 65                  70                  75                  80

Arg Val Gly Pro Asn Pro Lys Phe Asp Ala Val Ala Gly Tyr His Trp
                   85                  90                  95

Phe Asp Gly Asp Gly Met Ile His Gly Val Arg Ile Lys Asp Gly Lys
               100                 105                 110

Ala Thr Tyr Val Ser Arg Tyr Val Lys Thr Ser Arg Leu Lys Gln Glu
           115                 120                 125

Glu Phe Phe Gly Ala Ala Lys Phe Met Lys Ile Gly Asp Leu Lys Gly
       130                 135                 140

Phe Phe Gly Leu Leu Met Val Asn Val Gln Gln Leu Arg Thr Lys Leu
145                 150                 155                 160

Lys Ile Leu Asp Asn Thr Tyr Gly Asn Gly Thr Ala Asn Thr Ala Leu
               165                 170                 175

Val Tyr His His Gly Lys Leu Leu Ala Leu Gln Glu Ala Asp Lys Pro
               180                 185                 190

Tyr Val Ile Lys Val Leu Glu Asp Gly Asp Leu Gln Thr Leu Gly Ile
           195                 200                 205

Ile Asp Tyr Asp Lys Arg Leu Thr His Ser Phe Thr Ala His Pro Lys
       210                 215                 220

Val Asp Pro Val Thr Gly Glu Met Phe Thr Phe Gly Tyr Ser His Thr
225                 230                 235                 240

Pro Pro Tyr Leu Thr Tyr Arg Val Ile Ser Lys Asp Gly Ile Met His
               245                 250                 255

Asp Pro Val Pro Ile Thr Ile Ser Glu Pro Ile Met Met His Asp Phe
               260                 265                 270
```

Ala Ile Thr Glu Thr Tyr Ala Ile Phe Met Asp Leu Pro Met His Phe
    275   280   285

Arg Pro Lys Glu Met Val Lys Glu Lys Lys Met Ile Tyr Ser Phe Asp
    290   295   300

Pro Thr Lys Lys Ala Arg Phe Gly Val Leu Pro Arg Tyr Ala Lys Asp
305   310   315   320

Glu Leu Met Ile Arg Trp Phe Glu Leu Pro Asn Cys Phe Ile Phe His
            325   330   335

Asn Ala Asn Ala Trp Glu Glu Glu Asp Glu Val Val Leu Ile Thr Cys
        340   345   350

Arg Leu Glu Asn Pro Asp Leu Asp Met Val Ser Gly Lys Val Lys Glu
        355   360   365

Lys Leu Glu Asn Phe Gly Asn Glu Leu Tyr Glu Met Arg Phe Asn Met
        370   375   380

Lys Thr Gly Ser Ala Ser Gln Lys Lys Leu Ser Ala Ser Ala Val Asp
385   390   395   400

Phe Pro Arg Ile Asn Glu Cys Tyr Thr Gly Lys Lys Gln Arg Tyr Val
            405   410   415

Tyr Gly Thr Ile Leu Asp Ser Ile Ala Lys Val Thr Gly Ile Ile Lys
          420   425   430

Phe Asp Leu His Ala Glu Ala Glu Thr Gly Lys Arg Met Leu Glu Val
        435   440   445

Gly Gly Asn Ile Lys Gly Ile Tyr Asp Leu Gly Glu Gly Arg Tyr Gly
        450   455   460

Ser Glu Ala Ile Tyr Val Pro Arg Glu Thr Ala Glu Glu Asp Asp Gly
465   470   475   480

Tyr Leu Ile Phe Phe Val His Asp Glu Asn Thr Gly Lys Ser Cys Val
            485   490   495

Thr Val Ile Asp Ala Lys Thr Met Ser Ala Glu Pro Val Ala Val Val
        500   505   510

Glu Leu Pro His Arg Val Pro Tyr Gly Phe His Ala Leu Phe Val Thr
        515   520   525

Glu Glu Gln Leu Gln Glu Gln Thr Leu Ile
        530   535